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# UK METEOROLOGICAL OFFICE GLOBAL DATA MONITORING REPORT

January, 94

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2. Global Data Monitoring Statistics

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## 1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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## 2 Global Data Monitoring Statistics

### Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIBU observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12 UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

### Aircraft observations

TABLE 3 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m $s^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 $m\ s^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

| Figure | Parameter |
|---|---|
| 4 | Mean wind vectors |
| 5 | Mean observation - background wind vector |
| 6 | Mean observation-background speed ($m\ s^{-1}$) |
| 7 | RMS observation-background vector ($m\ s^{-1}$) |

## Radiosonde Observations

TABLES 4-6 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 4 and 5 and the weights used in the RMS values in TABLE 4.

## Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

| Figure | Parameter Plotted | Layer (hPa) |
|---|---|---|
| 10 | Availability/average daily number | 701-1000 |
| 11 | Vector mean wind (observed) | 701-1000 |
| 12 | Observation-background vector wind difference | 701-1000 |
| 13 | Mean observation-background speed differences | 701-1000 |
| 14 | RMS observation-background vector difference | 701-1000 |
| 15 | Availability/average daily number | 401-700 |
| 16 | Vector mean wind (observed) | 401-700 |
| 17 | Observation-background vector wind difference | 401-700 |
| 18 | Mean observation-background speed differences | 401-700 |
| 19 | RMS observation-background vector difference | 401-700 |
| 20 | Availability/average daily number | 101-400 |
| 21 | Vector mean wind (observed) | 101-400 |
| 22 | Observation-background vector wind difference | 101-400 |
| 23 | Mean observation-background speed differences | 101-400 |
| 24 | RMS observation-background vector difference | 101-400 |

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-12. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

| Figure | Layer (hPa) |
|---|---|
| 25/28 | 850-1000 |
| 26/29 | 100-300 |
| 27/30 | 30-50 |

## 3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 7 shows quality statistics for **Mean Sea-level Pressure**, **Windspeed** and **Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 8 shows quality statistics for **Temperature** and **Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 9 - 12 show quality statistics (**Geopotential Height** and **Windspeed** at **100** and **500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

# TABLE 1

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
## MONITORING CENTRE: BRACKNELL
## MONTH:January, 94

Monitoring procedures

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for ships, fixed buoys and platforms.

**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :00, 06, 12, 18 UTC

**Elements monitored** :Mean sea level pressure (hPa).
:Wind speed (m $s^{-1}$).
:Wind direction (Degrees).

**Parameters monitored** :NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
**N.B. a positive bias indicates the observation is veered to the background.**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

**GROSS ERROR LIMIT** :15 hPa (pressure)
:25 m $s^{-1}$ (vector wind)

**SELECTION CRITERIA** :NOBS $\geq$ 20 ,and one or more of the following:

1.|bias| $\geq$ 4 hPa (pressure),
$\geq$ 5 m $s^{-1}$ (wind speed)
$\geq$ 30 degrees (direction).

2.SD $\geq$ 6 hPa (pressure)
$\geq$ 80 degrees (direction).

3.PGE $\geq$ 25.

| IDENTIFIER | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | |
| DNJS | ALL | MSLP | SUR | 34 | 0 | 0 | 1.2 | -4.2 | 4.3 |
| DZSB | ALL | MSLP | SUR | 32 | 0 | 0 | 1.1 | -4.2 | 4.3 |
| EVMA | ALL | MSLP | SUR | 21 | 2 | 10 | 5.1 | 5.3 | 7.4 |
| OWOG2 | ALL | MSLP | SUR | 21 | 0 | 0 | 1.1 | 4.5 | 4.7 |
| UHUN | ALL | MSLP | SUR | 35 | 0 | 0 | 3.3 | 5.1 | 6.1 |
| UOVE | ALL | MSLP | SUR | 26 | 22 | 85 | 0.3 | 13.7 | 13.7 |
| UQJK | ALL | MSLP | SUR | 26 | 1 | 4 | 2.1 | 7.9 | 8.2 |
| UYDW | ALL | MSLP | SUR | 26 | 0 | 0 | 2.5 | 7.1 | 7.6 |
| UYJL | ALL | MSLP | SUR | 45 | 1 | 2 | 3.3 | -4.2 | 5.3 |
| UZMH | ALL | MSLP | SUR | 21 | 0 | 0 | 4.5 | -4.1 | 6.1 |
| VRCV | ALL | MSLP | SUR | 41 | 0 | 0 | 2.7 | -4.7 | 5.4 |
| V2SM | ALL | MSLP | SUR | 46 | 0 | 0 | 1.4 | -9.8 | 9.8 |
| WCZB | ALL | MSLP | SUR | 31 | 0 | 0 | 1.6 | 6.6 | 6.7 |
| WFJK | ALL | MSLP | SUR | 51 | 1 | 2 | 1.9 | -4.4 | 4.8 |
| ZSBK | ALL | MSLP | SUR | 22 | 0 | 0 | 3.5 | -7.0 | 7.8 |
| 3ELS2 | ALL | MSLP | SUR | 27 | 1 | 4 | 1.0 | 7.9 | 7.9 |
| 3ESD3 | ALL | MSLP | SUR | 45 | 0 | 0 | 3.9 | 4.7 | 6.1 |
| 3FJJ3 | ALL | MSLP | SUR | 24 | 0 | 0 | 1.7 | -10.1 | 10.3 |
| 71003 | ALL | MSLP | SUR | 684 | 684 | 100 | 0.0 | 0.0 | 0.0 |
| 74002 | ALL | MSLP | SUR | 589 | 114 | 19 | 2.8 | -8.6 | 9.1 |
| WIND SPEED | | | | | | | | | |
| C6IN5 | ALL | SPEED | SUR | 21 | 0 | 0 | 7.0 | 6.4 | 9.5 |
| C6KF2 | ALL | SPEED | SUR | 30 | 1 | 3 | 4.1 | 8.2 | 9.2 |
| DEOF | ALL | SPEED | SUR | 74 | 0 | 0 | 5.1 | 7.3 | 8.9 |
| DQFS | ALL | SPEED | SUR | 36 | 0 | 0 | 6.1 | 6.6 | 9.0 |
| DZLJ | ALL | SPEED | SUR | 35 | 0 | 0 | 3.4 | 5.4 | 6.4 |
| ELIH8 | ALL | SPEED | SUR | 52 | 0 | 0 | 3.2 | -5.0 | 6.0 |
| ELLE9 | ALL | SPEED | SUR | 83 | 2 | 2 | 5.0 | 10.5 | 11.6 |
| FNZP | ALL | SPEED | SUR | 26 | 2 | 8 | 5.4 | 8.0 | 9.7 |
| GZMM | ALL | SPEED | SUR | 33 | 0 | 0 | 4.3 | 5.0 | 6.6 |
| J8FO | ALL | SPEED | SUR | 25 | 0 | 0 | 4.9 | 5.2 | 7.1 |
| LXAM | ALL | SPEED | SUR | 37 | 1 | 3 | 6.4 | 6.7 | 9.3 |
| PJKI | ALL | SPEED | SUR | 55 | 1 | 2 | 5.3 | 6.2 | 8.2 |
| P3LE5 | ALL | SPEED | SUR | 23 | 0 | 0 | 3.2 | -7.5 | 8.1 |
| S6DX | ALL | SPEED | SUR | 33 | 0 | 0 | 3.8 | 5.0 | 6.3 |
| VMAL | ALL | SPEED | SUR | 22 | 0 | 0 | 5.3 | 5.9 | 8.0 |
| WEZM | ALL | SPEED | SUR | 29 | 0 | 0 | 6.0 | 6.4 | 8.8 |
| WJKV | ALL | SPEED | SUR | 33 | 0 | 0 | 3.7 | 5.5 | 6.6 |
| ZCUX | ALL | SPEED | SUR | 22 | 0 | 0 | 2.4 | 5.5 | 6.0 |
| 3EKI3 | ALL | SPEED | SUR | 25 | 2 | 8 | 6.4 | 9.2 | 11.2 |
| 3ELS2 | ALL | SPEED | SUR | 26 | 1 | 4 | 3.2 | -6.7 | 7.4 |
| 3EZH7 | ALL | SPEED | SUR | 98 | 0 | 0 | 1.8 | 5.2 | 5.5 |
| 9HPM3 | ALL | SPEED | SUR | 24 | 0 | 0 | 4.1 | 5.2 | 6.6 |
| WIND DIRECTION | | | | | | | | | |
| CG2614 | ALL | DIRN. | SUR | 50 | 0 | 0 | 31.5 | 31.3 | 44.5 |
| DUPV | ALL | DIRN. | SUR | 27 | 1 | 4 | 45.2 | 36.0 | 57.8 |
| VROZ | ALL | DIRN. | SUR | 20 | 0 | 0 | 52.2 | 34.9 | 62.8 |
| 21004 | ALL | DIRN. | SUR | 93 | 0 | 0 | 23.6 | 48.9 | 54.3 |
| 3ELS2 | ALL | DIRN. | SUR | 23 | 1 | 4 | 110.7 | -34.5 | 115.9 |
| 3ETG5 | ALL | DIRN. | SUR | 22 | 0 | 0 | 114.7 | 35.8 | 120.2 |
| 32321 | ALL | DIRN. | SUR | 33 | 0 | 0 | 31.7 | -41.1 | 51.9 |
| 46003 | ALL | DIRN. | SUR | 113 | 2 | 2 | 72.6 | -30.7 | 78.9 |
| 46025 | ALL | DIRN. | SUR | 31 | 0 | 0 | 60.0 | -39.0 | 71.6 |
| 46051 | ALL | DIRN. | SUR | 55 | 0 | 0 | 32.2 | -41.9 | 52.8 |
| 46053 | ALL | DIRN. | SUR | 36 | 0 | 0 | 68.9 | -31.7 | 75.9 |
| 46054 | ALL | DIRN. | SUR | 64 | 0 | 0 | 45.1 | -48.6 | 66.3 |
| 46131 | ALL | DIRN. | SUR | 38 | 0 | 0 | 37.4 | -47.3 | 60.3 |
| 46146 | ALL | DIRN. | SUR | 59 | 0 | 0 | 48.4 | -55.8 | 73.8 |
| 46181 | ALL | DIRN. | SUR | 52 | 0 | 0 | 97.4 | -8.2 | 97.8 |
| 46183 | ALL | DIRN. | SUR | 36 | 0 | 0 | 41.8 | -30.9 | 52.0 |

| IDENTIFIER | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| WIND DIRECTION | | | | | | | | | |
| 46185 | ALL | DIRN. | SUR | 102 | 0 | 0 | 33.6 | -34.5 | 48.2 |
| 51309 | ALL | DIRN. | SUR | 101 | 0 | 0 | 21.5 | -31.7 | 38.3 |
| 52004 | ALL | DIRN. | SUR | 35 | 0 | 0 | 61.3 | -46.6 | 77.1 |
| 52306 | ALL | DIRN. | SUR | 29 | 0 | 0 | 44.8 | -48.8 | 66.2 |
| 63006 | ALL | DIRN. | SUR | 434 | 0 | 0 | 43.0 | -33.3 | 54.4 |

AVAILABILITY - SHIP/SYNOP - JANUARY 1994
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 18628

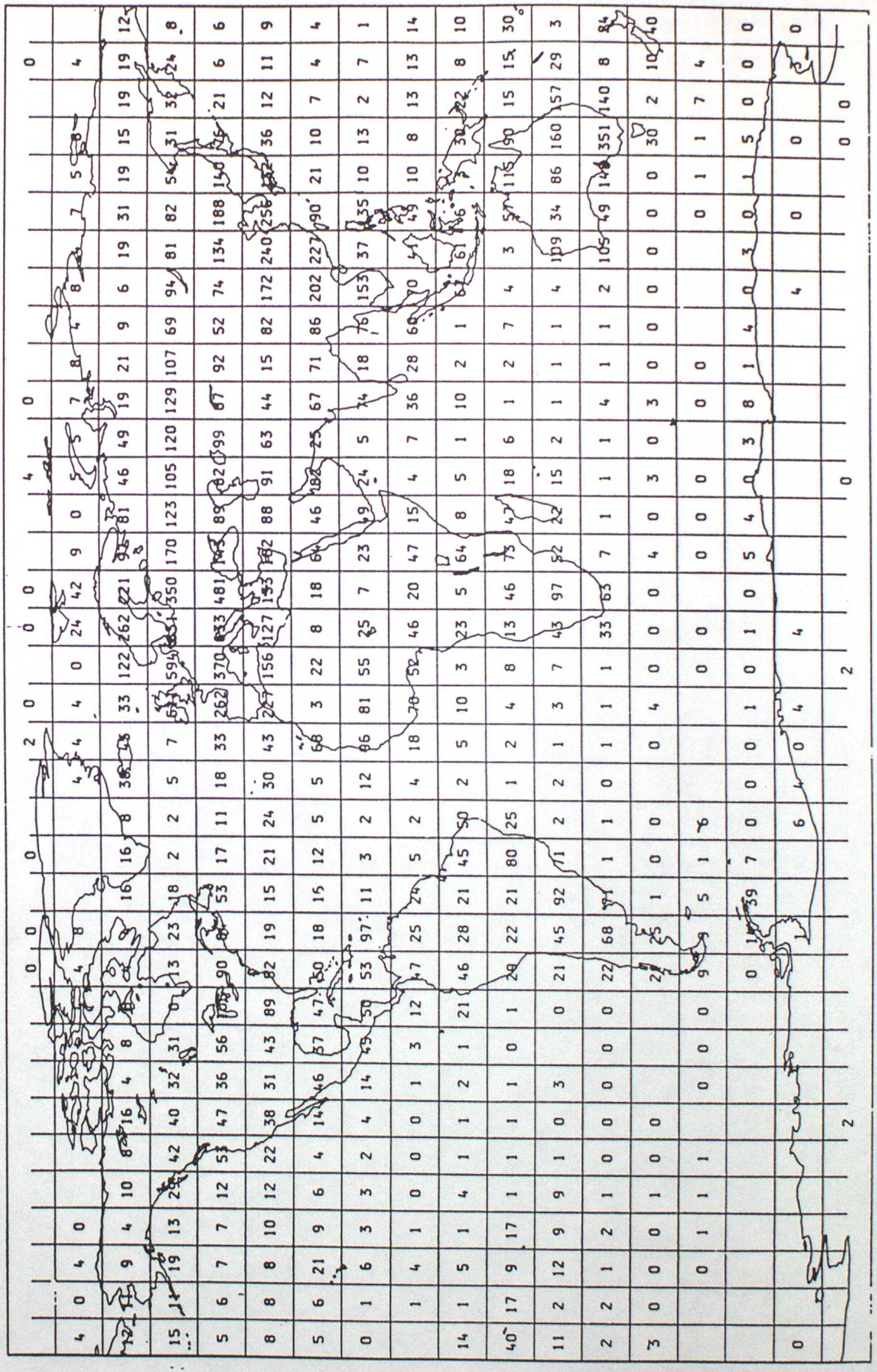


FIGURE 1

## TABLE 2

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - DRIFTING BUOYS
## MONITORING CENTRE: BRACKNELL
## MONTH:January, 94

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for drifting buoys.

**Standard of comparison** :Background field from Bracknell global model.

**Position** :Average Latitude and Longitude for period.

**Observation times** :00, 06, 12, 18 UTC

**Elements monitored**
:Mean sea level pressure (hPa)
:Wind speed (m $s^{-1}$),
:Wind direction (degrees).

**Parameters monitored**

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
**N.B. a positive bias indicates the observation is veered to the background.**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

**GROSS ERROR LIMIT**
:15 hPa (pressure)
:25 m $s^{-1}$ (vector wind)

**SELECTION CRITERIA** :NOBS ≥ 20 ,and one or more of the following:

1. |bias| ≥ 4 hPa (pressure).
≥ 5 m $s^{-1}$ (wind speed).
≥ 30 degrees (direction).

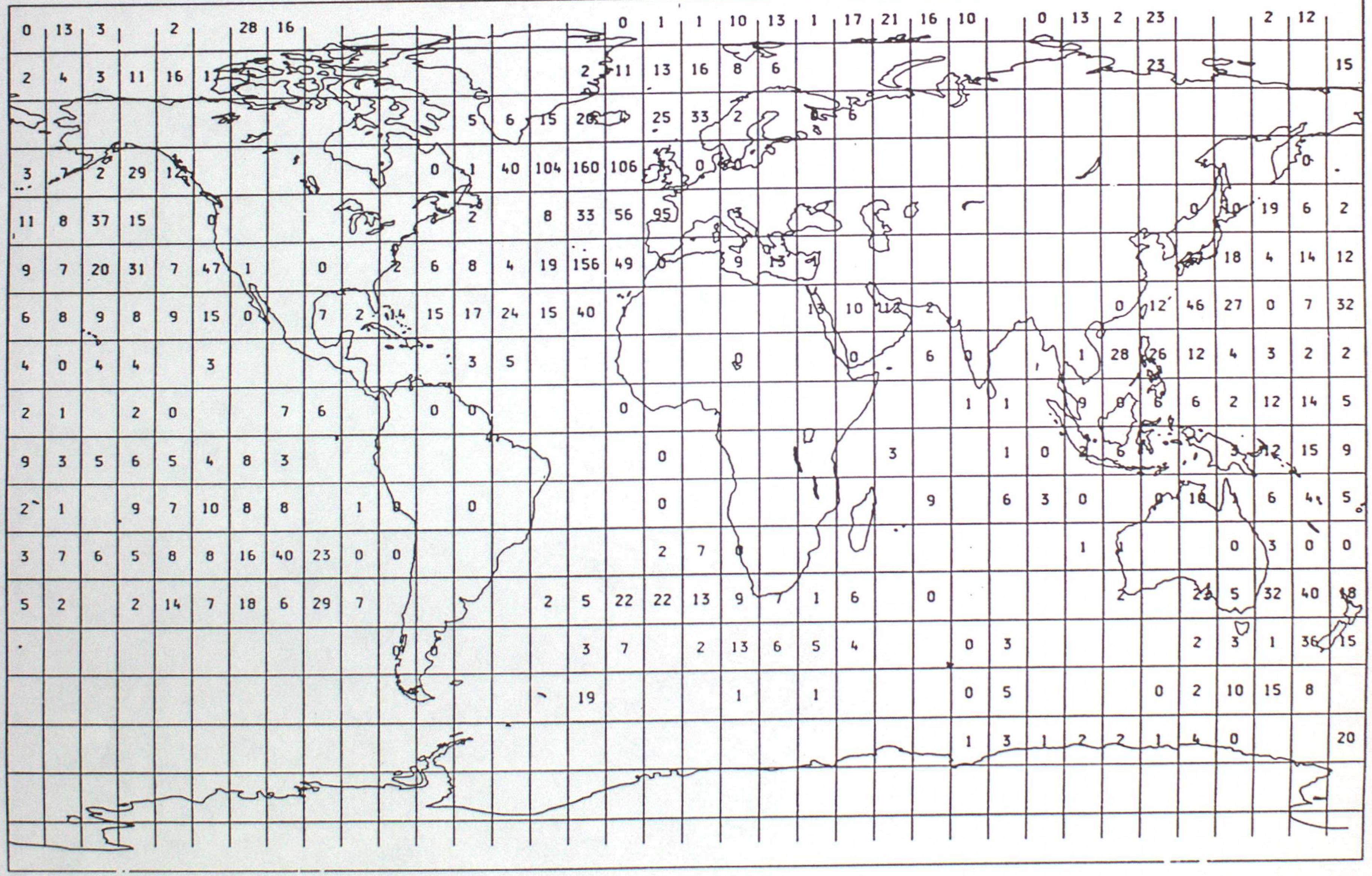
2. SD ≥ 6 hPa (pressure).
≥ 80 degrees (direction).

3. PGE ≥ 25.

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | | | |
| 17569 | -31.2 | 93.2 | ALL | MSLP | SUR | 182 | 182 | 100 | 0.0 | 0.0 | 0.0 |
| 46638 | 46.8 | -150.9 | ALL | MSLP | SUR | 72 | 31 | 43 | 4.8 | -6.4 | 8.0 |
| 64910 | 67.0 | 1.2 | ALL | MSLP | SUR | 58 | 54 | 93 | 4.7 | -0.2 | 4.7 |
| 71557 | -58.8 | 159.4 | ALL | MSLP | SUR | 378 | 203 | 54 | 3.2 | -11.4 | 11.9 |

AVAILABILITY - DRIBU - JANUARY 1994
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 3022

FIGURE 2


0 13 3 2 28 16 0 1 1 10 13 1 17 21 16 10 0 13 2 23 2 12
2 4 3 11 16 1 2 11 13 16 8 6 23 15
5 6 15 26 25 33 2 6
3 7 2 29 12 0 1 40 104 160 106 0 0 0
11 8 37 15 0 2 8 33 56 95 0 10 19 6 2
9 7 20 31 7 47 1 0 2 6 8 4 19 156 49 0 9 13 18 4 14 12
6 8 9 8 9 15 0 7 2 14 15 17 24 15 40 1 13 10 12 2 0 12 46 27 0 7 32
4 0 4 4 3 3 5 0 0 6 0 1 28 26 12 4 3 2 2
2 1 2 0 7 6 0 0 0 1 1 9 8 6 6 2 12 14 5
9 3 5 6 5 4 8 3 0 3 1 0 2 6 3 12 15 9
2 1 9 7 10 8 8 1 0 0 0 9 6 3 0 0 18 1 6 4 5
3 7 6 5 8 8 16 40 23 0 0 2 7 0 1 1 0 3 0 0
5 2 2 14 7 18 6 29 7 2 5 22 22 13 9 7 1 6 0 2 23 5 32 40 18
3 7 2 13 6 5 4 0 3 2 3 1 36 15
19 1 1 0 5 0 2 10 15 8
1 3 1 2 2 1 4 0 20

# TABLE 3

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH:January ,94

**Monitoring procedures:**

**Period** :One calendar month.

**Data monitored** :Statistics for each airline carrier.

**Area monitored** :90°N - 90°S, 180°W - 180°E.

**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :All hours combined.

**Level(s) monitored** :70.0 - 500.0 hPa

**Elements monitored** :TEMP in °C ; WIND in $m\ s^{-1}$

**Parameters monitored** :N REP.:Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

**GROSS ERROR LIMITS** :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

**SELECTION CRITERIA** :N REP ≥ 20

**NB:- DUE TO A TEMPORARY ARCHIVING PROBLEM STATISTICS FOR IDENTIFIERS UAL, AN, BA, CO, DL, KL, NW AND QF DO NOT INCLUDE DATA BETWEEN 1500 UTC AND 2100 UTC. THIS DATA IS ALSO EXCLUDED FROM FIGURES 4 TO 7**

| | TEMPERATURE | | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAA | 98 | 0 | 2 | 2.1 | 0.0 | 97 | 0 | 2 | 1 | 8.1 | 0.4 |
| AAH | 23 | 30 | 26 | 4.1 | 0.9 | 23 | 0 | 13 | 0 | 10.5 | 0.9 |
| AAL | 3195 | 0 | 1 | 1.9 | 0.1 | 3238 | 0 | 1 | 0 | 9.4 | 1.5 |
| AAR | 1656 | 1 | 2 | 2.1 | -0.3 | 1664 | 0 | 2 | 0 | 9.3 | 1.5 |
| ACA | 815 | 1 | 2 | 2.4 | -0.5 | 837 | 0 | 3 | 1 | 9.6 | 1.5 |
| ACI | 75 | 0 | 1 | 1.9 | 0.9 | 73 | 0 | 0 | 0 | 7.5 | 2.1 |
| ADV | 26 | 0 | 4 | 4.1 | 3.6 | 26 | 0 | 0 | 0 | 6.6 | -1.3 |
| AEA | 146 | 1 | 5 | 1.7 | -0.4 | 142 | 1 | 6 | 0 | 11.5 | 0.9 |
| AEL | 439 | 2 | 3 | 1.9 | -0.4 | 446 | 0 | 2 | 0 | 9.6 | 1.5 |
| AFL | 159 | 4 | 100 | 4.1 | 2.3 | 163 | 1 | 100 | 0 | 17.0 | 0.9 |
| AFR | 998 | 1 | 6 | 1.9 | 0.0 | 1009 | 0 | 6 | 0 | 9.4 | 1.3 |
| AJJ | 49 | 0 | 0 | 2.3 | -0.6 | 49 | 0 | 2 | 0 | 8.8 | -0.6 |
| AMT | 127 | 1 | 2 | 1.7 | 0.5 | 130 | 0 | 2 | 0 | 10.3 | 1.3 |
| AMX | 369 | 0 | 1 | 1.9 | -0.3 | 372 | 1 | 2 | 0 | 9.2 | 1.0 |
| ANA | 783 | 1 | 1 | 2.2 | 0.5 | 783 | 0 | 2 | 1 | 8.8 | 1.7 |
| ANG | 21 | 0 | 0 | 1.5 | 0.5 | 21 | 0 | 0 | 0 | 5.9 | 1.4 |
| ANZ | 3485 | 1 | 2 | 1.7 | 0.1 | 3472 | 0 | 2 | 1 | 8.5 | 0.8 |
| AOM | 616 | 3 | 5 | 2.1 | 0.5 | 622 | 0 | 4 | 0 | 10.3 | 1.5 |
| ARG | 35 | 0 | 0 | 1.5 | -0.1 | 34 | 0 | 3 | 0 | 11.2 | 1.1 |
| ARP | 316 | 0 | 5 | 1.6 | -0.1 | 314 | 0 | 6 | 0 | 7.4 | 1.7 |
| AUA | 57 | 0 | 100 | 1.8 | -0.5 | 57 | 0 | 0 | 0 | 7.5 | 1.2 |
| AVA | 374 | 2 | 3 | 2.0 | 0.0 | 375 | 0 | 3 | 0 | 10.9 | 1.4 |
| AVN | 43 | 0 | 2 | 1.2 | 0.5 | 44 | 0 | 2 | 0 | 5.9 | 1.8 |
| AVY | 28 | 0 | 7 | 2.4 | -0.4 | 28 | 0 | 7 | 0 | 8.8 | 1.5 |
| AZA | 424 | 1 | 4 | 2.2 | 0.2 | 423 | 0 | 4 | 0 | 10.5 | 1.8 |
| BAL | 68 | 0 | 10 | 1.6 | -0.2 | 69 | 0 | 12 | 0 | 9.3 | 2.9 |
| BAW | 891 | 1 | 7 | 2.0 | -0.1 | 896 | 0 | 8 | 1 | 8.4 | 1.8 |
| BBB | 42 | 2 | 19 | 1.4 | -0.4 | 44 | 0 | 11 | 0 | 12.5 | -0.1 |
| BWA | 558 | 1 | 2 | 1.8 | 0.6 | 559 | 0 | 3 | 0 | 9.8 | 1.6 |
| CAL | 1748 | 1 | 3 | 2.3 | -0.1 | 1748 | 0 | 3 | 0 | 9.5 | 1.6 |
| CCA | 278 | 2 | 94 | 3.0 | -0.2 | 278 | 0 | 6 | 0 | 11.5 | 1.2 |
| CDN | 2378 | 0 | 3 | 2.3 | 0.4 | 2386 | 0 | 3 | 1 | 9.0 | 1.4 |
| CES | 220 | 0 | 1 | 2.1 | 0.2 | 222 | 0 | 2 | 0 | 9.3 | 1.1 |
| CFC | 20 | 0 | 10 | 2.4 | -1.3 | 20 | 0 | 10 | 0 | 8.8 | 2.0 |
| CFG | 826 | 0 | 2 | 2.1 | -1.0 | 824 | 0 | 2 | 0 | 9.1 | 1.1 |
| CKS | 115 | 3 | 98 | 2.6 | 1.0 | 115 | 6 | 98 | 0 | 16.9 | 3.6 |
| CKT | 28 | 0 | 4 | 1.7 | 0.5 | 28 | 0 | 4 | 0 | 11.4 | 0.1 |
| CLX | 37 | 0 | 0 | 1.9 | -0.3 | 39 | 0 | 0 | 0 | 8.6 | 2.0 |
| CMI | 1661 | 1 | 3 | 2.3 | 0.4 | 1673 | 0 | 3 | 0 | 9.6 | 1.2 |
| CMM | 158 | 0 | 1 | 2.1 | -0.3 | 159 | 0 | 0 | 0 | 8.7 | 1.9 |
| COA | 651 | 1 | 2 | 1.9 | 0.1 | 653 | 0 | 2 | 1 | 9.2 | 1.2 |
| CPA | 329 | 1 | 0 | 1.7 | -0.2 | 322 | 0 | 1 | 0 | 8.7 | 2.2 |
| CRL | 271 | 0 | 0 | 1.8 | 0.0 | 271 | 0 | 3 | 0 | 9.2 | 1.8 |
| CTM | 67 | 0 | 13 | 2.2 | -1.5 | 67 | 0 | 12 | 0 | 10.2 | 1.9 |
| CUB | 151 | 8 | 100 | 2.7 | 0.6 | 151 | 0 | 10 | 1 | 13.1 | 0.4 |
| DAE | 20 | 0 | 0 | 1.6 | -1.1 | 20 | 0 | 0 | 0 | 9.9 | 2.3 |
| DAL | 4500 | 0 | 2 | 2.4 | 0.6 | 4315 | 0 | 2 | 0 | 9.4 | 1.3 |
| DHL | 140 | 1 | 9 | 2.9 | -0.1 | 142 | 0 | 17 | 0 | 17.3 | 3.8 |
| DLH | 3529 | 0 | 5 | 2.0 | -0.2 | 3509 | 0 | 7 | 2 | 8.7 | 1.5 |
| DOA | 86 | 1 | 5 | 1.3 | -0.3 | 89 | 0 | 8 | 0 | 10.6 | 0.3 |
| EIA | 226 | 2 | 10 | 2.4 | 0.0 | 237 | 0 | 11 | 0 | 12.2 | 3.5 |
| EIN | 24 | 4 | 4 | 2.5 | 1.5 | 24 | 4 | 4 | 0 | 11.1 | 3.0 |
| ELY | 120 | 1 | 9 | 1.7 | 0.1 | 120 | 1 | 8 | 0 | 8.3 | 0.1 |
| EVA | 1036 | 0 | 3 | 2.2 | -0.4 | 1039 | 0 | 3 | 0 | 9.9 | 1.1 |
| EWW | 35 | 6 | 9 | 2.1 | -0.5 | 35 | 0 | 11 | 3 | 12.4 | 1.7 |
| FDX | 1061 | 0 | 4 | 2.2 | 0.8 | 1069 | 0 | 3 | 0 | 9.4 | 1.6 |
| FIN | 334 | 1 | 3 | 2.1 | 0.7 | 335 | 0 | 5 | 1 | 9.0 | 1.3 |
| FJI | 457 | 1 | 2 | 1.7 | 0.7 | 461 | 0 | 1 | 0 | 7.7 | 1.6 |
| GAF | 42 | 0 | 0 | 2.3 | -0.3 | 44 | 0 | 2 | 0 | 10.6 | 1.0 |

| | | TEMPERATURE | | | | | | WIND | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| GEC | 27 | 0 | 7 | 2.2 | 0.3 | 27 | 0 | 11 | 0 | 13.2 | 4.9 |
| GIA | 345 | 1 | 2 | 1.7 | 0.2 | 337 | 0 | 3 | 1 | 8.0 | 1.2 |
| HAL | 1143 | 1 | 2 | 2.2 | 0.8 | 1150 | 0 | 3 | 1 | 11.0 | 1.4 |
| HLF | 154 | 1 | 3 | 1.9 | -1.2 | 150 | 0 | 3 | 0 | 8.2 | 0.9 |
| IBE | 1916 | 1 | 12 | 2.0 | -0.2 | 1907 | 0 | 13 | 0 | 9.9 | 1.0 |
| ICE | 344 | 0 | 1 | 1.9 | 0.1 | 343 | 0 | 3 | 2 | 7.9 | 1.5 |
| JAA | 39 | 0 | 0 | 2.1 | 0.7 | 39 | 0 | 0 | 0 | 8.2 | 3.2 |
| JAL | 5478 | 0 | 2 | 2.2 | 0.5 | 5486 | 0 | 2 | 0 | 9.4 | 1.5 |
| JAS | 114 | 0 | 1 | 2.1 | 0.8 | 114 | 0 | 1 | 0 | 9.5 | 1.6 |
| JAZ | 130 | 0 | 5 | 2.3 | 1.3 | 131 | 1 | 5 | 0 | 11.3 | 1.4 |
| KAL | 3413 | 1 | 5 | 2.7 | -0.1 | 3411 | 0 | 2 | 0 | 9.5 | 1.5 |
| KLM | 1434 | 0 | 1 | 1.9 | 0.3 | 1434 | 0 | 2 | 0 | 8.6 | 1.4 |
| LDA | 301 | 1 | 13 | 2.2 | -1.2 | 303 | 0 | 12 | 0 | 9.8 | 1.0 |
| LDI | 203 | 0 | 2 | 2.0 | -1.3 | 205 | 0 | 3 | 0 | 9.1 | 1.3 |
| LIB | 159 | 0 | 0 | 2.0 | -0.7 | 161 | 0 | 1 | 1 | 8.0 | 0.3 |
| LOT | 147 | 0 | 1 | 1.7 | -0.3 | 149 | 0 | 3 | 0 | 9.4 | 1.4 |
| LTU | 815 | 1 | 5 | 2.2 | 0.3 | 779 | 0 | 5 | 0 | 9.9 | 1.3 |
| MAH | 67 | 1 | 1 | 1.8 | -0.3 | 67 | 0 | 3 | 0 | 9.0 | -1.1 |
| MAS | 266 | 1 | 2 | 2.0 | 0.8 | 264 | 0 | 3 | 1 | 10.0 | 1.0 |
| MAU | 23 | 0 | 4 | 1.8 | 0.7 | 21 | 0 | 14 | 0 | 10.0 | 3.8 |
| MDA | 129 | 2 | 5 | 3.4 | 1.9 | 129 | 0 | 2 | 0 | 8.5 | 0.5 |
| MOD | 27 | 4 | 4 | 1.8 | -0.3 | 27 | 0 | 4 | 0 | 10.4 | 2.0 |
| MPH | 350 | 0 | 3 | 1.7 | -0.1 | 351 | 0 | 4 | 0 | 9.0 | 1.4 |
| NAL | 112 | 0 | 6 | 3.0 | 1.0 | 113 | 0 | 4 | 0 | 10.3 | 0.4 |
| NAT | 21 | 0 | 0 | 1.6 | -0.1 | 21 | 0 | 0 | 0 | 10.9 | 3.3 |
| NCA | 643 | 0 | 1 | 2.1 | 0.2 | 644 | 0 | 1 | 0 | 9.8 | 1.7 |
| NGA | 93 | 0 | 1 | 1.5 | -0.2 | 91 | 0 | 3 | 2 | 8.9 | -0.4 |
| NWA | 11139 | 0 | 2 | 2.3 | 0.6 | 11124 | 0 | 2 | 0 | 9.6 | 1.5 |
| PAL | 1136 | 1 | 2 | 2.2 | -0.2 | 1147 | 0 | 3 | 1 | 10.2 | 0.9 |
| PAO | 460 | 2 | 3 | 1.5 | 0.5 | 455 | 0 | 3 | 0 | 8.4 | 1.2 |
| QFA | 2238 | 1 | 2 | 1.8 | 0.3 | 2232 | 0 | 3 | 1 | 8.5 | 1.3 |
| RAF | 211 | 1 | 2 | 2.2 | -0.1 | 209 | 0 | 3 | 1 | 10.2 | 2.2 |
| RKA | 90 | 0 | 2 | 1.7 | 0.5 | 88 | 0 | 5 | 0 | 12.0 | 2.6 |
| RON | 67 | 1 | 3 | 1.1 | 0.4 | 66 | 0 | 3 | 2 | 7.1 | 0.8 |
| RRR | 165 | 4 | 31 | 2.8 | -0.3 | 165 | 1 | 26 | 0 | 10.4 | 2.0 |
| SAA | 224 | 0 | 2 | 2.3 | -0.9 | 227 | 1 | 4 | 0 | 11.0 | 1.6 |
| SAS | 1712 | 0 | 1 | 1.9 | -0.1 | 1702 | 0 | 3 | 1 | 8.3 | 0.9 |
| SIA | 1319 | 0 | 2 | 2.1 | -0.3 | 1309 | 0 | 3 | 1 | 9.5 | 1.3 |
| SJM | 51 | 25 | 22 | 1.6 | 0.8 | 57 | 0 | 5 | 0 | 9.7 | 3.2 |
| SOL | 82 | 2 | 1 | 1.4 | 0.4 | 81 | 0 | 2 | 2 | 7.1 | 2.1 |
| SPP | 190 | 2 | 4 | 1.6 | -0.3 | 185 | 0 | 3 | 0 | 8.8 | 0.5 |
| SSR | 28 | 0 | 0 | 1.1 | 0.4 | 28 | 0 | 7 | 7 | 6.0 | -0.4 |
| SVA | 100 | 1 | 4 | 2.1 | -0.5 | 107 | 0 | 2 | 0 | 10.3 | 1.8 |
| SWR | 353 | 2 | 5 | 1.8 | 0.2 | 344 | 0 | 4 | 0 | 10.0 | 2.7 |
| TAP | 558 | 1 | 3 | 2.0 | -0.5 | 558 | 0 | 3 | 0 | 11.2 | 1.2 |
| THA | 328 | 1 | 3 | 2.4 | -0.5 | 328 | 0 | 4 | 1 | 10.3 | 0.8 |
| TOW | 67 | 0 | 1 | 2.0 | -0.1 | 69 | 0 | 3 | 0 | 12.6 | 1.4 |
| TWA | 1001 | 1 | 1 | 2.0 | 0.2 | 993 | 0 | 1 | 0 | 10.2 | 1.2 |
| UAL | 60841 | 1 | 4 | 1.7 | 0.1 | 60843 | 0 | 2 | 0 | 9.1 | 1.3 |
| UKR | 22 | 5 | 36 | 5.2 | 3.7 | 26 | 0 | 23 | 0 | 19.8 | 1.2 |
| ULE | 107 | 0 | 0 | 1.6 | -0.2 | 109 | 0 | 4 | 0 | 11.4 | 1.5 |
| UPS | 590 | 3 | 11 | 2.3 | -0.4 | 597 | 0 | 10 | 0 | 10.2 | 1.3 |
| VIA | 535 | 1 | 7 | 1.8 | 0.1 | 538 | 0 | 8 | 1 | 10.0 | 2.0 |
| VIR | 21 | 0 | 10 | 2.7 | -0.5 | 21 | 0 | 0 | 0 | 9.3 | 2.4 |
| VRB | 32 | 0 | 0 | 2.6 | 1.3 | 33 | 0 | 0 | 0 | 7.4 | -0.6 |
| VRG | 25 | 0 | 12 | 1.7 | -0.6 | 39 | 0 | 10 | 0 | 10.4 | 1.1 |
| VSP | 132 | 2 | 3 | 2.2 | 0.1 | 133 | 0 | 2 | 0 | 10.3 | 2.2 |
| WOA | 59 | 0 | 8 | 1.9 | 0.5 | 68 | 0 | 7 | 0 | 8.8 | 1.9 |
| AN | 23582 | 0 | 1 | 1.3 | 0.2 | 23335 | 0 | 1 | 0 | 9.5 | 1.5 |
| BA | 7071 | 0 | 7 | 2.0 | 0.7 | 7049 | 1 | 7 | 0 | 10.9 | 2.2 |
| DL | 518 | 4 | 100 | 3.1 | 0.4 | 518 | 73 | 100 | 0 | 49.4 | -0.4 |
| FJ | 43 | 0 | 5 | 1.6 | 0.9 | 43 | 0 | 5 | 0 | 7.8 | 0.3 |
| KL | 3633 | 1 | 51 | 2.1 | 1.2 | 3631 | 1 | 6 | 0 | 10.9 | 1.4 |

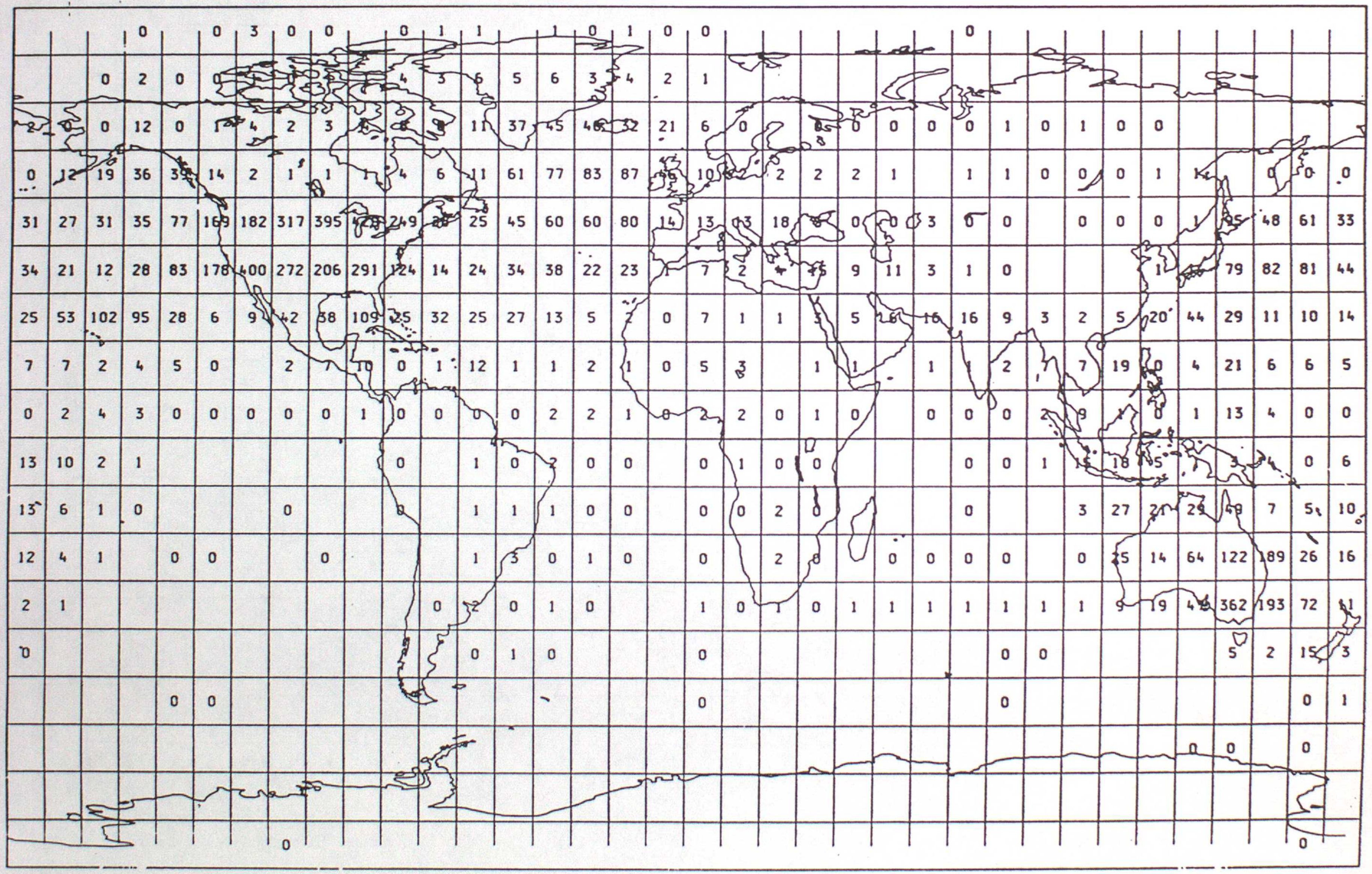
|  | TEMPERATURE |  |  |  |  | WIND |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| LH | 875 | 0 | 3 | 2.0 | -0.4 | 861 | 0 | 3 | 1 | 8.4 | 1.9 |
| NW | 31123 | 0 | 1 | 1.8 | 0.3 | 31120 | 0 | 1 | 0 | 8.5 | 1.0 |
| PA | 21 | 0 | 0 | 1.4 | 1.0 | 21 | 0 | 0 | 0 | 7.1 | 1.0 |
| QF | 7893 | 0 | 1 | 1.4 | 0.4 | 7883 | 0 | 1 | 0 | 8.8 | 0.9 |
| M | 170 | 5 | 98 | 2.7 | 0.7 | 178 | 0 | 4 | 0 | 10.3 | 0.6 |
| N | 362 | 3 | 4 | 2.7 | 0.3 | 388 | 0 | 3 | 0 | 10.9 | 1.7 |

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

JANUARY 1994

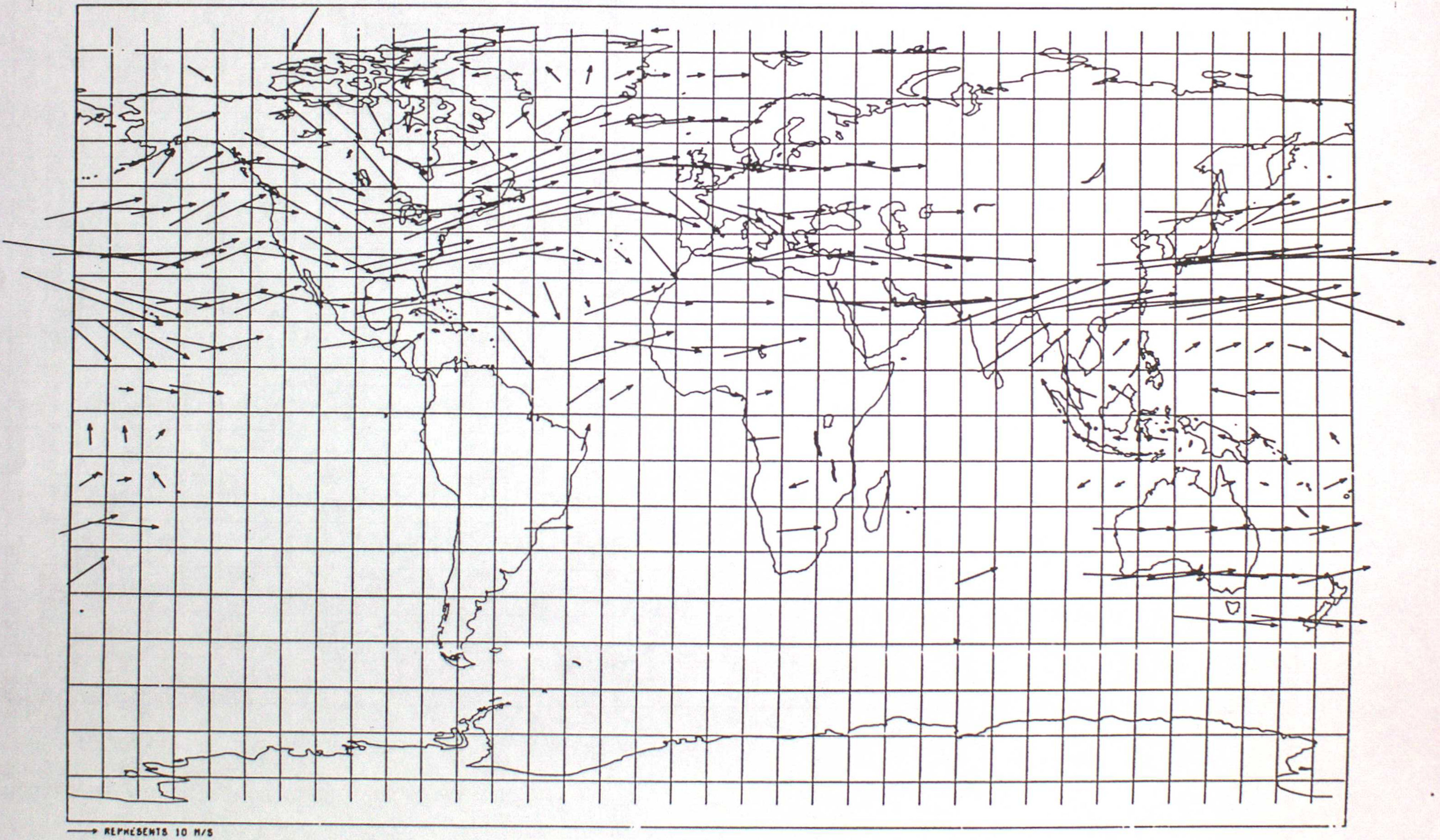
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED

FIGURE 3


0 0 3 0 0 0 1 1 1 0 1 0 0 0
0 2 0 0 4 3 6 5 6 3 4 2 1
2 0 0 12 0 1 4 2 3 11 37 45 46 32 21 6 0 0 0 0 0 1 0 1 0 0
0 12 19 36 39 14 2 1 1 1 4 6 11 61 77 83 87 10 2 2 2 1 1 1 0 0 0 1 1 0 0 0
31 27 31 35 77 169 182 317 395 249 25 45 60 60 80 14 13 13 18 0 0 3 0 0 0 0 0 1 48 61 33
34 21 12 28 83 178 400 272 206 291 124 14 24 34 38 22 23 7 2 9 11 3 1 0 1 79 82 81 44
25 53 102 95 28 6 9 42 38 109 25 32 25 27 13 5 2 0 7 1 1 3 5 16 16 16 9 3 2 5 20 44 29 11 10 14
7 7 2 4 5 0 2 7 10 0 1 12 1 1 2 1 0 5 3 1 1 1 1 2 7 7 19 0 4 21 6 6 5
0 2 4 3 0 0 0 0 0 1 0 0 0 0 2 2 1 2 2 0 1 0 0 0 0 2 9 1 0 1 13 4 0 0
13 10 2 1 0 1 0 2 0 0 0 1 0 0 0 0 1 18 5 3 4 0 6
13 6 1 0 0 0 1 1 1 0 0 0 0 2 0 0 3 27 21 29 49 7 5 10
12 4 1 0 0 0 1 3 0 1 0 0 2 0 0 0 0 0 0 25 14 64 122 189 26 16
2 1 0 2 0 1 0 1 0 1 0 1 1 1 1 1 1 1 9 19 49 362 193 72 11
0 0 1 0 0 0 0 5 2 15 3
0 0 0 0 0 1
0 0 0
0 0

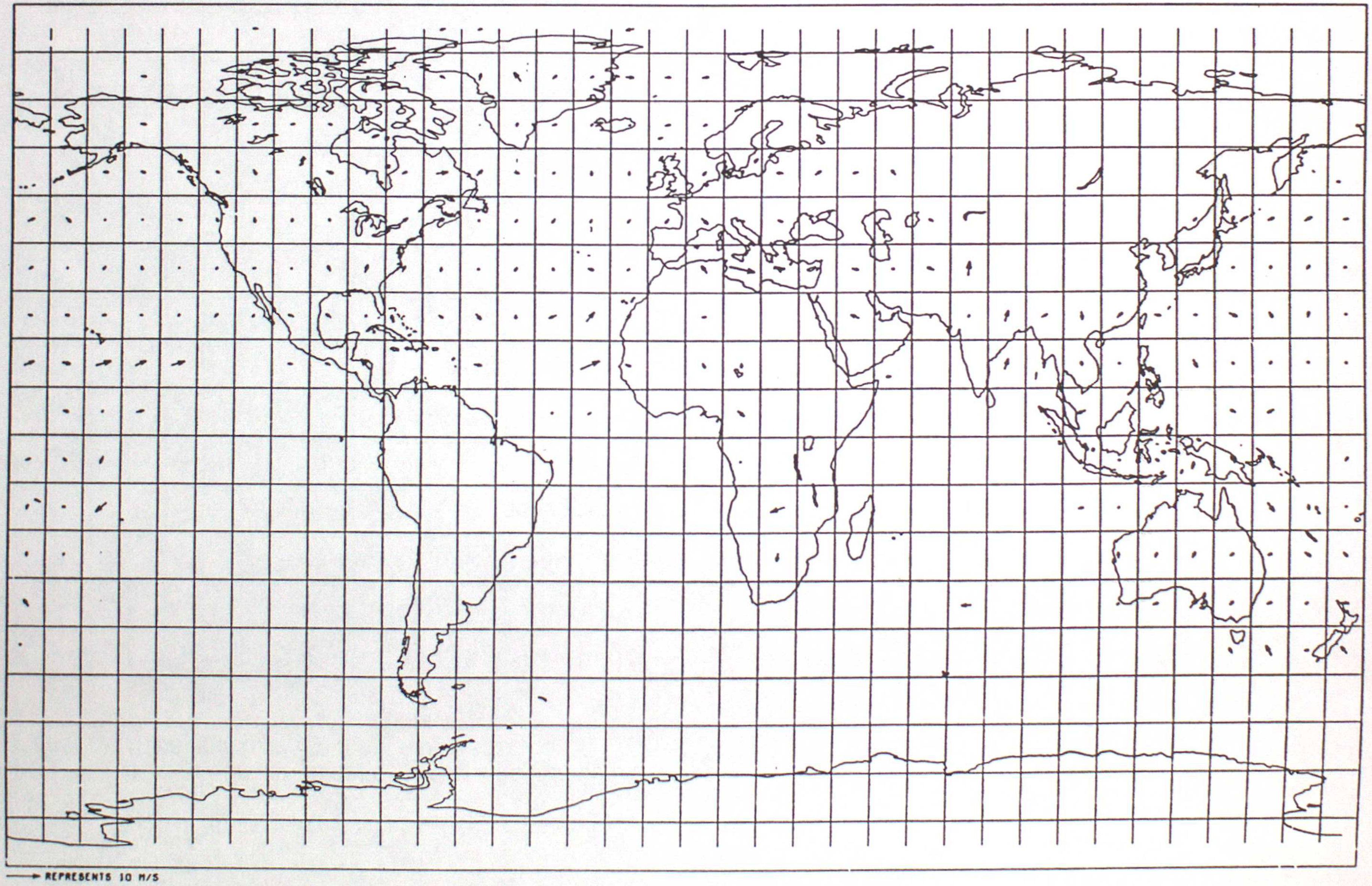
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA
JANUARY 1994
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 4

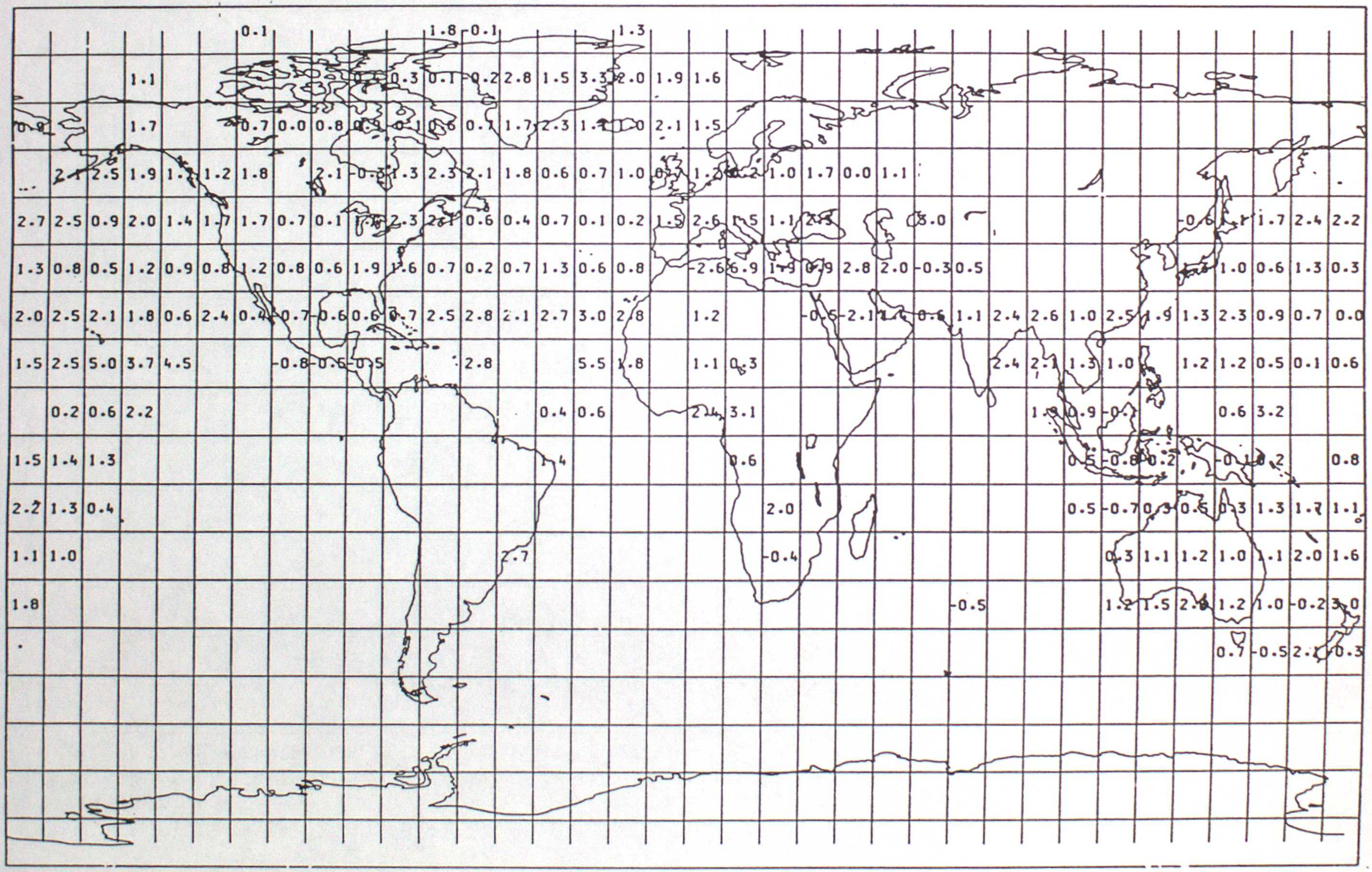


AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA
JANUARY 1994
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

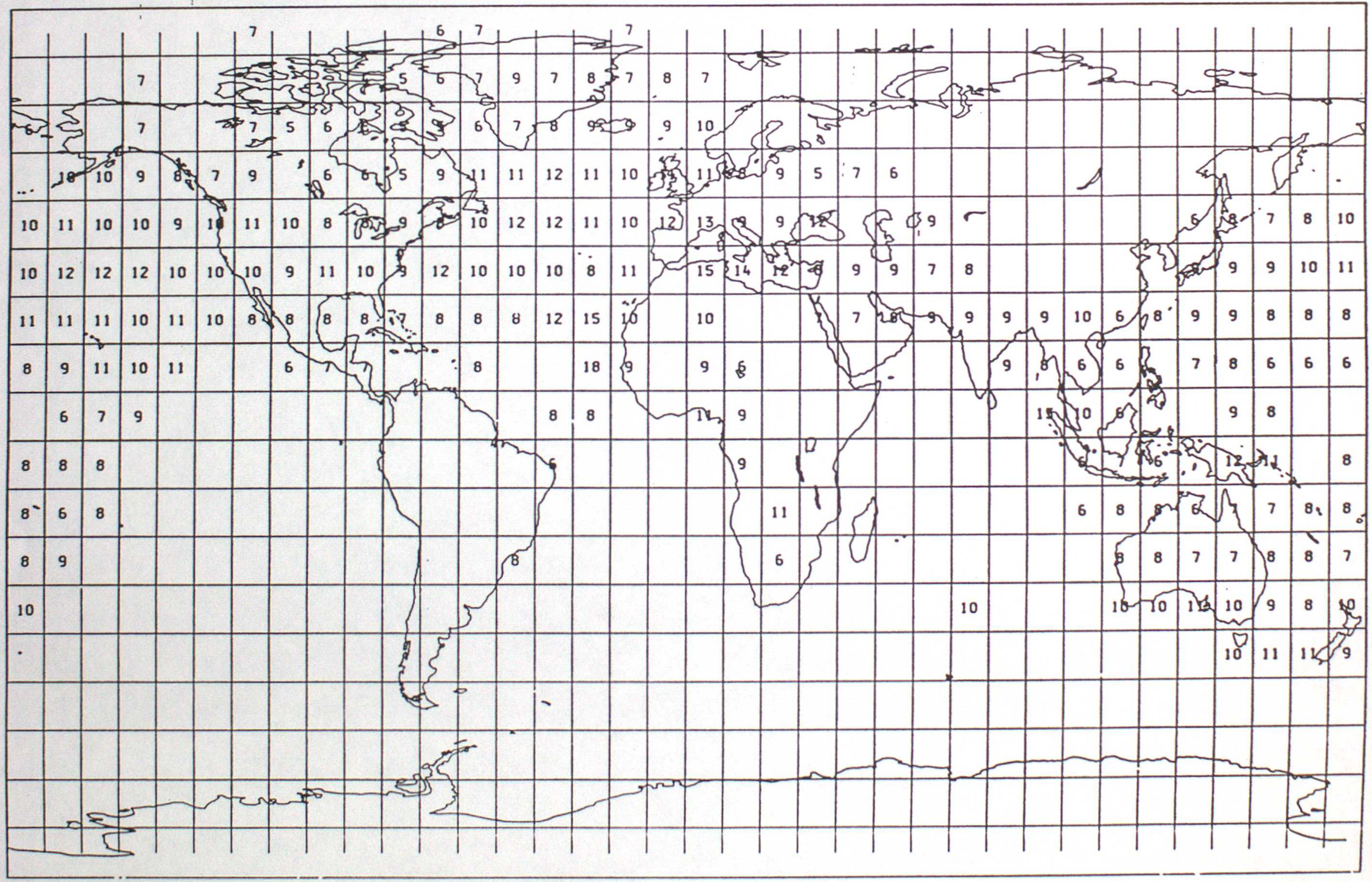
FIGURE 5



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JANUARY 1994
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


0.1 1.8 -0.1 1.3
1.1 0.3 0.1 -0.2 2.8 1.5 3.3 2.0 1.9 1.6
0.9 1.7 0.7 0.0 0.8 0.6 0.1 1.7 2.3 1.5 2.1 1.5
2.1 2.5 1.9 1.2 1.2 1.8 2.1 -0.3 1.3 2.3 2.1 1.8 0.6 0.7 1.0 1.2 0.2 1.0 1.7 0.0 1.1
2.7 2.5 0.9 2.0 1.4 1.7 1.7 0.7 0.1 2.3 2.1 0.6 0.4 0.7 0.1 0.2 1.5 2.6 1.5 1.1 2.5 3.0 -0.6 1.1 1.7 2.4 2.2
1.3 0.8 0.5 1.2 0.9 0.8 1.2 0.8 0.6 1.9 1.6 0.7 0.2 0.7 1.3 0.6 0.8 -2.6 6.9 1.9 0.9 2.8 2.0 -0.3 0.5 1.0 0.6 1.3 0.3
2.0 2.5 2.1 1.8 0.6 2.4 0.4 -0.7 -0.6 0.6 0.7 2.5 2.8 2.1 2.7 3.0 2.8 1.2 -0.5 -2.1 1.4 0.6 1.1 2.4 2.6 1.0 2.5 1.9 1.3 2.3 0.9 0.7 0.0
1.5 2.5 5.0 3.7 4.5 -0.8 -0.6 -0.5 2.8 5.5 1.8 1.1 0.3 2.4 2.1 1.3 1.0 1.2 1.2 0.5 0.1 0.6
0.2 0.6 2.2 0.4 0.6 2.4 3.1 1.9 0.9 -0.1 0.6 3.2
1.5 1.4 1.3 1.4 0.6 0.5 -0.8 0.2 -0.1 0.2 0.8
2.2 1.3 0.4 2.0 0.5 -0.7 0.3 -0.5 0.3 1.3 1.7 1.1
1.1 1.0 2.7 -0.4 0.3 1.1 1.2 1.0 1.1 2.0 1.6
1.8 -0.5 1.2 1.5 2.8 1.2 1.0 -0.2 3.0
0.7 -0.5 2.1 0.3

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
JANUARY 1994
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


7 6 7 7
7 5 6 7 9 7 8 7 8 7
6 7 7 5 6 6 7 8 9 9 9 10
18 10 9 8 7 9 6 6 5 9 11 11 12 11 10 11 11 8 9 5 7 6
10 11 10 10 9 10 11 10 8 9 8 10 12 12 11 10 12 13 9 9 12 9 6 8 7 8 10
10 12 12 12 10 10 10 9 11 10 9 12 10 10 10 8 11 15 14 12 6 9 9 7 8 9 9 10 11
11 11 11 10 11 10 8 8 8 8 7 8 8 8 12 15 10 10 7 18 9 9 9 9 10 6 8 9 9 8 8 8
8 9 11 10 11 6 7 8 18 9 9 6 9 8 6 6 7 8 6 6 6
6 7 9 8 8 11 9 15 10 6 9 8
8 8 8 6 9 6 7 6 12 11 8
8 6 8 11 6 8 8 6 7 7 8 8
8 9 8 6 8 8 7 7 8 8 7
10 10 10 10 11 10 9 8 10
10 11 11 9

## TABLE 4

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:January, 94

**Monitoring procedures:**
**Period** :One calendar month.
**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.
**Area monitored** :90°N - 90°S, 180°W - 180°E.
**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :00 UTC and 12 UTC.

**Level(s) monitored** :Standard levels between 1000.0 - 30.0 hPa

**Element monitored** :GEOPOTENTIAL HEIGHT IN metres

**Parameters monitored**
:NUM OBS :Number of observations available at level shown during period.
:NUM GROSS :Number of gross errors at level shown during period.
:% REJ :Percentage of observations rejected by quality control at level shown during period.
:SD :SD of difference of observations from background values at level shown excluding those with gross errors.
:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.
:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA :≥ 3 levels with ≥ 10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | SD | BIAS | RMS | NUM LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|
| 26258 | 12 | Z | 200 | 58/ 28 | 22 | 0 | 61.4 | 79.1 | 100.1 | 9 |
| 29282 | 00 | Z | 200 | 58/ 97 | 16 | 0 | 19.2 | -89.3 | 91.3 | 7 |
| 34731 | 00 | Z | 200 | 47/ 40 | 25 | 0 | 56.8 | -82.4 | 100.1 | 7 |
| 41977 | 00 | Z | 250 | 22/ 92 | 24 | 1 | 50.8 | -112.2 | 123.2 | 7 |
| 42027 | 12 | Z | 70 | 34/ 75 | 11 | 1 | 184.4 | 77.8 | 200.1 | 8 |
| 42101 | 00 | Z | 200 | 30/ 76 | 19 | 0 | 99.7 | -47.6 | 110.5 | 6 |
| 42101 | 12 | Z | 150 | 30/ 76 | 10 | 0 | 97.3 | 65.0 | 117.0 | 5 |
| 42182 | 00 | Z | 150 | 29/ 77 | 29 | 0 | 107.7 | -68.9 | 127.9 | 9 |
| 42182 | 12 | Z | 30 | 29/ 77 | 23 | 0 | 221.0 | 67.5 | 231.1 | 6 |
| 42314 | 12 | Z | 250 | 27/ 95 | 11 | 0 | 67.9 | -72.8 | 99.6 | 4 |
| 42339 | 00 | Z | 200 | 26/ 73 | 20 | 0 | 79.8 | -97.5 | 126.1 | 6 |
| 42339 | 12 | Z | 250 | 26/ 73 | 24 | 0 | 99.3 | -39.5 | 106.9 | 5 |
| 42361 | 00 | Z | 100 | 26/ 78 | 11 | 1 | 155.6 | -45.2 | 162.0 | 7 |
| 42361 | 12 | Z | 100 | 26/ 78 | 8 | 2 | 43.3 | -155.5 | 161.4 | 6 |
| 42369 | 00 | Z | 50 | 27/ 81 | 18 | 1 | 200.8 | -90.6 | 220.3 | 10 |
| 42369 | 12 | Z | 70 | 27/ 81 | 15 | 2 | 183.7 | -94.5 | 206.6 | 9 |
| 42379 | 00 | Z | 50 | 27/ 83 | 18 | 1 | 185.5 | -3.4 | 185.5 | 8 |
| 42379 | 12 | Z | 50 | 27/ 83 | 10 | 1 | 186.3 | 10.2 | 186.6 | 7 |
| 42410 | 00 | Z | 30 | 26/ 92 | 17 | 3 | 235.0 | 107.6 | 258.5 | 8 |
| 42410 | 12 | Z | 70 | 26/ 92 | 10 | 2 | 205.9 | -37.0 | 209.2 | 7 |
| 42492 | 00 | Z | 150 | 26/ 85 | 19 | 2 | 104.0 | -48.4 | 114.8 | 4 |
| 42492 | 12 | Z | 150 | 26/ 85 | 11 | 0 | 107.4 | -84.6 | 136.7 | 4 |
| 42647 | 00 | Z | 50 | 23/ 73 | 10 | 0 | 122.8 | -170.8 | 210.4 | 8 |
| 42667 | 00 | Z | 100 | 23/ 77 | 12 | 0 | 164.4 | -89.8 | 187.3 | 8 |
| 42809 | 00 | Z | 50 | 23/ 88 | 19 | 1 | 195.4 | -8.6 | 195.6 | 8 |
| 42809 | 12 | Z | 100 | 23/ 88 | 21 | 1 | 165.5 | -53.0 | 173.8 | 8 |
| 42867 | 00 | Z | 250 | 21/ 79 | 18 | 1 | 90.3 | -52.0 | 104.2 | 9 |
| 42867 | 12 | Z | 70 | 21/ 79 | 18 | 1 | 117.5 | -64.4 | 134.0 | 6 |
| 42971 | 00 | Z | 50 | 20/ 86 | 18 | 1 | 189.6 | -6.2 | 189.7 | 7 |
| 42971 | 12 | Z | 70 | 20/ 86 | 20 | 0 | 157.9 | -87.6 | 180.6 | 5 |
| 43003 | 00 | Z | 70 | 19/ 73 | 7 | 5 | 202.4 | -88.9 | 221.1 | 8 |
| 43003 | 12 | Z | 70 | 19/ 73 | 16 | 2 | 207.2 | 10.1 | 207.5 | 8 |
| 43014 | 00 | Z | 150 | 20/ 75 | 17 | 2 | 109.8 | -79.9 | 135.7 | 9 |
| 43014 | 12 | Z | 70 | 20/ 75 | 11 | 2 | 166.6 | 66.9 | 179.5 | 6 |
| 43128 | 00 | Z | 150 | 17/ 78 | 24 | 2 | 83.0 | -100.9 | 130.6 | 6 |
| 43128 | 12 | Z | 100 | 17/ 78 | 17 | 1 | 132.7 | 24.3 | 134.9 | 5 |
| 43150 | 12 | Z | 150 | 18/ 83 | 24 | 0 | 91.7 | 40.5 | 100.3 | 6 |
| 43185 | 00 | Z | 150 | 16/ 81 | 16 | 0 | 97.4 | -51.5 | 110.1 | 4 |
| 43185 | 12 | Z | 100 | 16/ 81 | 15 | 1 | 154.8 | -8.0 | 155.0 | 6 |
| 43192 | 00 | Z | 150 | 15/ 74 | 21 | 0 | 126.6 | -72.9 | 146.1 | 7 |
| 43192 | 12 | Z | 70 | 15/ 74 | 20 | 1 | 213.1 | 80.3 | 227.8 | 7 |
| 43279 | 00 | Z | 100 | 13/ 80 | 21 | 2 | 131.7 | -110.7 | 172.0 | 7 |
| 43279 | 12 | Z | 150 | 13/ 80 | 25 | 1 | 135.4 | -39.8 | 141.2 | 8 |
| 43285 | 00 | Z | 250 | 13/ 75 | 26 | 0 | 77.0 | -32.3 | 83.5 | 6 |
| 43285 | 12 | Z | 50 | 13/ 75 | 12 | 1 | 185.7 | 15.5 | 186.3 | 8 |
| 43295 | 12 | Z | 100 | 13/ 78 | 10 | 0 | 87.9 | 106.5 | 138.1 | 4 |
| 43311 | 00 | Z | 150 | 11/ 73 | 11 | 2 | 134.0 | 8.2 | 134.2 | 4 |
| 43311 | 12 | Z | 150 | 11/ 73 | 9 | 1 | 107.2 | 77.9 | 132.5 | 6 |
| 43333 | 12 | Z | 50 | 12/ 93 | 10 | 0 | 251.8 | 24.7 | 253.0 | 7 |
| 43346 | 00 | Z | 50 | 11/ 80 | 15 | 0 | 212.4 | -67.6 | 222.9 | 9 |
| 43353 | 00 | Z | 100 | 10/ 76 | 20 | 1 | 122.3 | -60.8 | 136.5 | 5 |
| 43353 | 12 | Z | 100 | 10/ 76 | 16 | 0 | 162.9 | 33.9 | 166.4 | 6 |
| 43369 | 00 | Z | 70 | 8/ 73 | 17 | 1 | 171.4 | -61.3 | 182.0 | 8 |
| 43369 | 12 | Z | 50 | 8/ 73 | 12 | 1 | 196.0 | 101.8 | 220.9 | 9 |
| 43371 | 00 | Z | 200 | 8/ 77 | 25 | 2 | 107.5 | -96.8 | 144.7 | 10 |
| 43371 | 12 | Z | 70 | 8/ 77 | 13 | 3 | 133.5 | -156.5 | 205.7 | 6 |
| 56739 | 00 | Z | 100 | 25/ 98 | 28 | 0 | 54.8 | 103.3 | 116.9 | 4 |
| 56985 | 12 | Z | 100 | 23/ 103 | 30 | 0 | 34.5 | 114.3 | 119.4 | 5 |
| 60360 | 12 | Z | 300 | 37/ 8 | 5 | 5 | 74.3 | -129.2 | 149.1 | 5 |
| 62306 | 12 | Z | 50 | 31/ 27 | 6 | 7 | 40.9 | 331.7 | 334.2 | 9 |
| 62378 | 12 | Z | 100 | 30/ 31 | 9 | 2 | 57.8 | 212.7 | 220.4 | 5 |
| 70414 | 00 | Z | 70 | 53/ 174 | 11 | 0 | 47.7 | 145.5 | 153.1 | 5 |
| 98223 | 00 | Z | 150 | 18/ 121 | 25 | 3 | 90.0 | -91.9 | 128.6 | 11 |

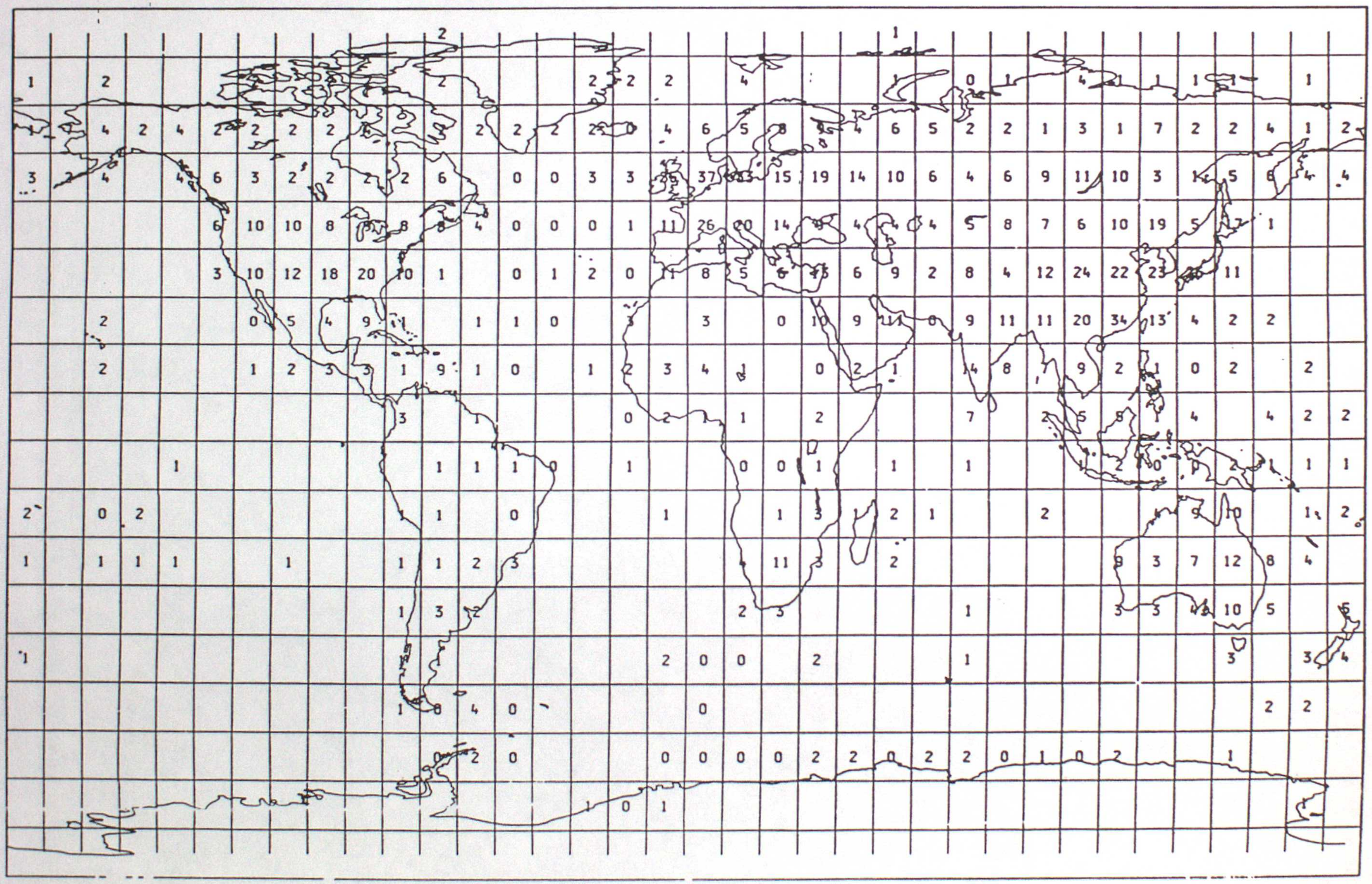
AVAILABILITY - TEMP - 500 HPA GEOPOTENTIAL - JANUARY 1994

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1422


2 1
1 2 2 2 2 2 4 1 0 1 4 1 1 1 1 1
1 4 2 4 2 2 2 2 2 2 2 2 2 4 6 5 8 5 4 6 5 2 2 1 3 1 7 2 2 4 1 2
3 4 4 6 3 2 2 2 2 6 0 0 3 3 35 37 43 15 19 14 10 6 4 6 9 11 10 3 1 5 6 4 4
6 10 10 8 8 8 4 0 0 0 1 11 26 20 14 4 4 4 5 8 7 6 10 19 5 7 1
3 10 12 18 20 10 1 0 1 2 0 11 8 5 6 45 6 9 2 8 4 12 24 22 23 20 11
2 0 5 4 9 1 1 1 0 3 3 0 10 9 11 0 9 11 11 20 34 13 4 2 2
2 1 2 3 3 1 9 1 0 1 2 3 4 1 0 2 1 14 8 7 9 2 1 0 2 2
3 1 0 2 1 1 2 7 2 5 8 1 4 4 2 2
1 1 1 1 0 1 0 0 1 1 1 1 2 0 1 2 1 1 1
2 0 2 1 1 0 1 1 3 1 2 1 2 9 10 1 2
1 1 1 1 1 1 1 2 3 4 11 3 2 8 3 7 12 8 4
1 3 2 2 3 1 3 3 4 10 5 5
1 1 1 2 0 0 2 1 3 3 4
1 8 4 0 0 2 2
2 0 0 0 0 0 2 2 0 2 2 0 1 0 2 1
1 0 1

## TABLE 5

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
**MONITORING CENTRE: BRACKNELL**
**MONTH: January, 94**

**Monitoring procedures:**
**Period** :One calendar month.
**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.
**Area monitored** :90°N - 90°S, 180°W - 180°E.
**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :00 UTC and 12 UTC.

**Level(s) monitored** :Standard levels between 1000.0 - 100.0 hPa

**Element monitored** :VECTOR WIND in m $s^{-1}$

**Parameters monitored**
:NUM OBS :Number of observations available at level shown during period.
:NUM GROSS :Number of gross errors at level shown during period.
:% REJ :Percentage of observations rejected by quality control at level shown during period.
:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
:NUM LEVELS :Number of levels satisfying selection criteria.

**GROSS ERROR LIMITS** :Defined in Appendix I.2

**SELECTION CRITERIA** :≥ 10 observations and ≥ 15 m $s^{-1}$ RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa
WITH HIGHEST RMS IS SHOWN

| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | % REJ | UBIAS | VBIAS | RMS | LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 41780 | 00 | V | 150 | 25/ 67 | 12 | 0 | 0 | -13.8 | -2.6 | 16.7 | 2 |
| 41977 | 00 | V | 100 | 22/ 92 | 23 | 0 | 39 | 2.5 | -23.6 | 16.2 | 2 |
| 42182 | 12 | V | 100 | 29/ 77 | 30 | 0 | 10 | 4.9 | 0.7 | 15.0 | 1 |
| 42339 | 00 | V | 200 | 26/ 73 | 19 | 0 | 15 | -17.6 | 1.6 | 20.9 | 3 |
| 42339 | 12 | V | 150 | 26/ 73 | 18 | 0 | 11 | -15.5 | -0.7 | 17.7 | 3 |
| 42361 | 12 | V | 300 | 26/ 78 | 16 | 0 | 6 | 9.8 | 1.5 | 16.3 | 1 |
| 42369 | 00 | V | 100 | 27/ 81 | 21 | 0 | 14 | -5.0 | 0.3 | 16.0 | 1 |
| 42369 | 12 | V | 150 | 27/ 81 | 24 | 1 | 20 | -7.8 | -4.2 | 20.2 | 3 |
| 42379 | 00 | V | 200 | 27/ 83 | 21 | 0 | 0 | -13.7 | -3.6 | 17.4 | 2 |
| 42379 | 12 | V | 200 | 27/ 83 | 17 | 0 | 0 | -9.2 | -5.0 | 15.9 | 2 |
| 42410 | 12 | V | 250 | 26/ 92 | 12 | 0 | 16 | -14.2 | 1.5 | 22.2 | 2 |
| 43014 | 00 | V | 100 | 20/ 75 | 11 | 0 | 63 | -4.0 | 4.3 | 24.5 | 3 |
| 43014 | 12 | V | 200 | 20/ 75 | 12 | 0 | 16 | 19.0 | 5.3 | 24.4 | 2 |
| 56691 | 00 | V | 100 | 27/ 104 | 26 | 0 | 26 | 5.2 | 7.1 | 17.3 | 1 |
| 58968 | 00 | V | 250 | 25/ 122 | 28 | 0 | 17 | 8.0 | 0.2 | 21.2 | 2 |
| 58968 | 12 | V | 300 | 25/ 122 | 28 | 0 | 10 | 2.3 | 0.3 | 16.5 | 1 |
| 61415 | 12 | V | 250 | 21/ -17 | 10 | 0 | 10 | 4.1 | 2.8 | 16.4 | 1 |
| 62378 | 00 | V | 400 | 30/ 31 | 13 | 1 | 35 | 1.7 | -12.8 | 15.3 | 1 |
| 87418 | 12 | V | 100 | -33/ -69 | 10 | 1 | 100 | 12.1 | -11.6 | 19.3 | 2 |

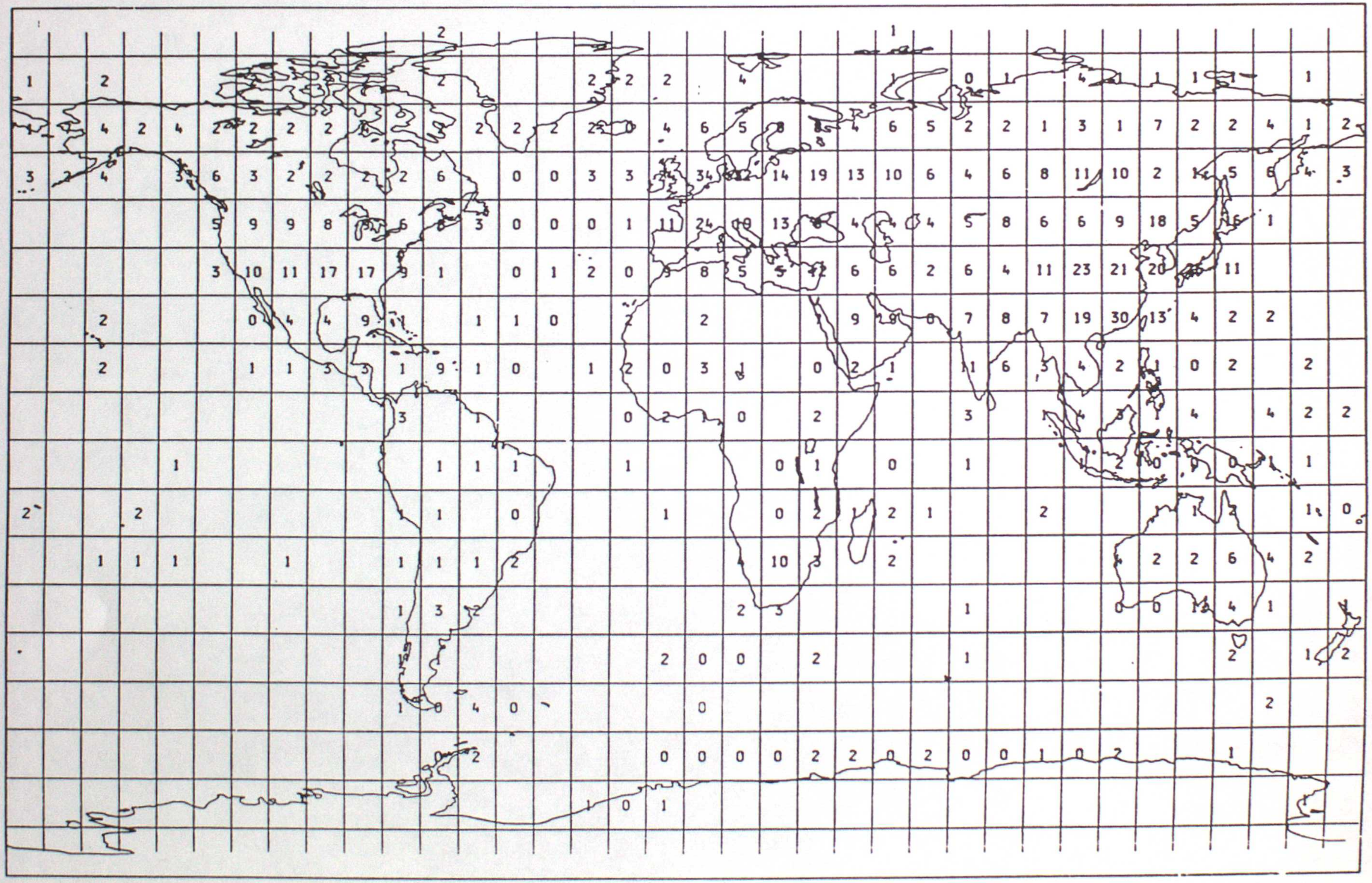
AVAILABILITY - TEMP/PILOT - 300 HPA WIND - JANUARY 1994

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1236



## TABLE 6

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH:January, 94

**Monitoring procedures:**

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.

**Area monitored** :90°N - 90°S, 180°W - 180°E.

**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :00 UTC and 12 UTC.

**Level(s) monitored** :Standard levels between 500.0 - 150.0 hPa

**Element monitored** :WIND DIRECTION in degrees

**Parameters monitored**
:NUM OBS :Average number of observations at all levels.
:BIAS :Mean difference of observations from background values from all levels.
:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels.
:SD :SD of difference of observations from background values at all levels.

**SELECTION CRITERIA**
:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

| WMO IDENT | OBS TIME | ELM | LAT/LONG | NUM OBS | BIAS | MAX SPREAD | SD |
|---|---|---|---|---|---|---|---|
| 28952 | 00 | DD | 53/ 64 | 18 | -13.5 | 5.8 | 17.5 |
| 28952 | 12 | DD | 53/ 64 | 18 | -10.5 | 3.1 | 14.4 |
| 38457 | 00 | DD | 41/ 69 | 28 | -10.7 | 7.5 | 16.5 |
| 48407 | 00 | DD | 15/ 105 | 13 | -27.2 | 8.0 | 25.7 |
| 60630 | 12 | DD | 27/ 2 | 20 | 12.8 | 4.1 | 15.6 |
| 78988 | 12 | DD | 12/ -69 | 15 | -15.6 | 9.5 | 25.0 |
| 91334 | 00 | DD | 7/ 152 | 26 | -10.7 | 7.6 | 25.9 |
| 91765 | 12 | DD | -14/-171 | 19 | -12.7 | 3.1 | 23.5 |

## MONITORING OF SATELLITE WINDS

## MONITORING CENTRE: BRACKNELL

## MONTH:January, 94

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from GOES, METEOSAT, GMS, INSAT.

**Standard of comparison** :Background field from Bracknell global model.

**Selection Criteria** :number of observations > 10.

**Data Extracted** :Layer:
701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

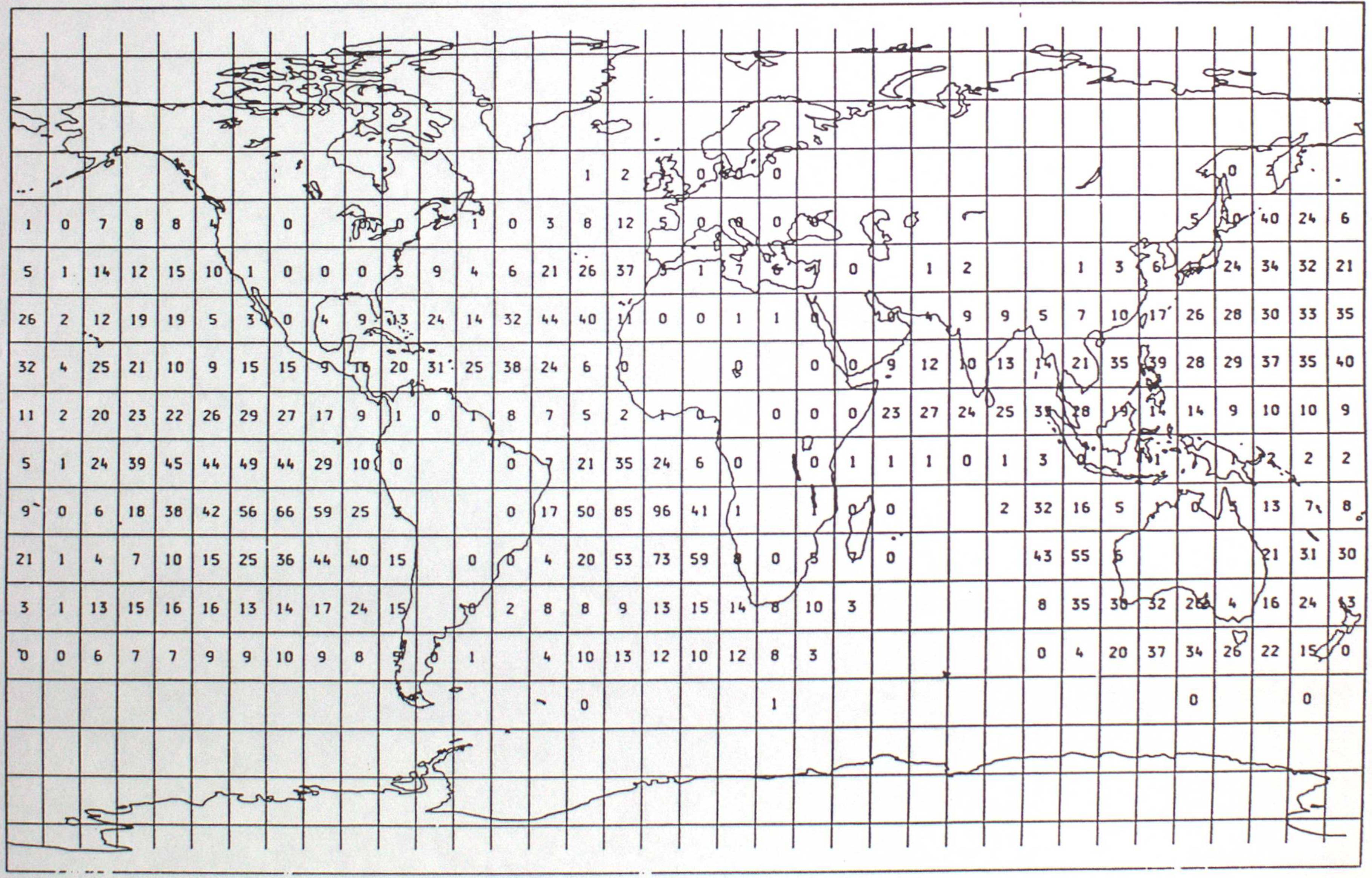
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JANUARY 1994


1 2 0 0 0 0 2
1 0 7 8 8 4 0 0 0 0 1 0 3 8 12 5 0 0 0 5 0 40 24 6
5 1 14 12 15 10 1 0 0 0 5 9 4 6 21 26 37 3 1 7 6 0 1 2 1 3 6 24 34 32 21
26 2 12 19 19 5 3 0 4 9 13 24 14 32 44 40 11 0 0 1 1 0 10 4 9 9 5 7 10 17 26 28 30 33 35
32 4 25 21 10 9 15 15 9 16 20 31 25 38 24 6 0 0 0 0 9 12 10 13 14 21 35 39 28 29 37 35 40
11 2 20 23 22 26 29 27 17 9 1 0 1 8 7 5 2 1 0 0 0 0 23 27 24 25 35 28 19 14 14 9 10 10 9
5 1 24 39 45 44 49 44 29 10 0 0 7 21 35 24 6 0 0 1 1 1 0 1 3 0 1 1 2 2 2
9 0 6 18 38 42 56 66 59 25 5 0 17 50 85 96 41 1 1 0 0 2 32 16 5 0 5 13 7 8
21 1 4 7 10 15 25 36 44 40 15 0 0 4 20 53 73 59 8 0 5 7 0 43 55 5 21 31 30
3 1 13 15 16 16 13 14 17 24 15 0 2 8 8 9 13 15 14 8 10 3 8 35 30 32 26 4 16 24 13
0 0 6 7 7 9 9 10 9 8 5 0 1 4 10 13 12 10 12 8 3 0 4 20 37 34 26 22 15 0
0 1 0 0

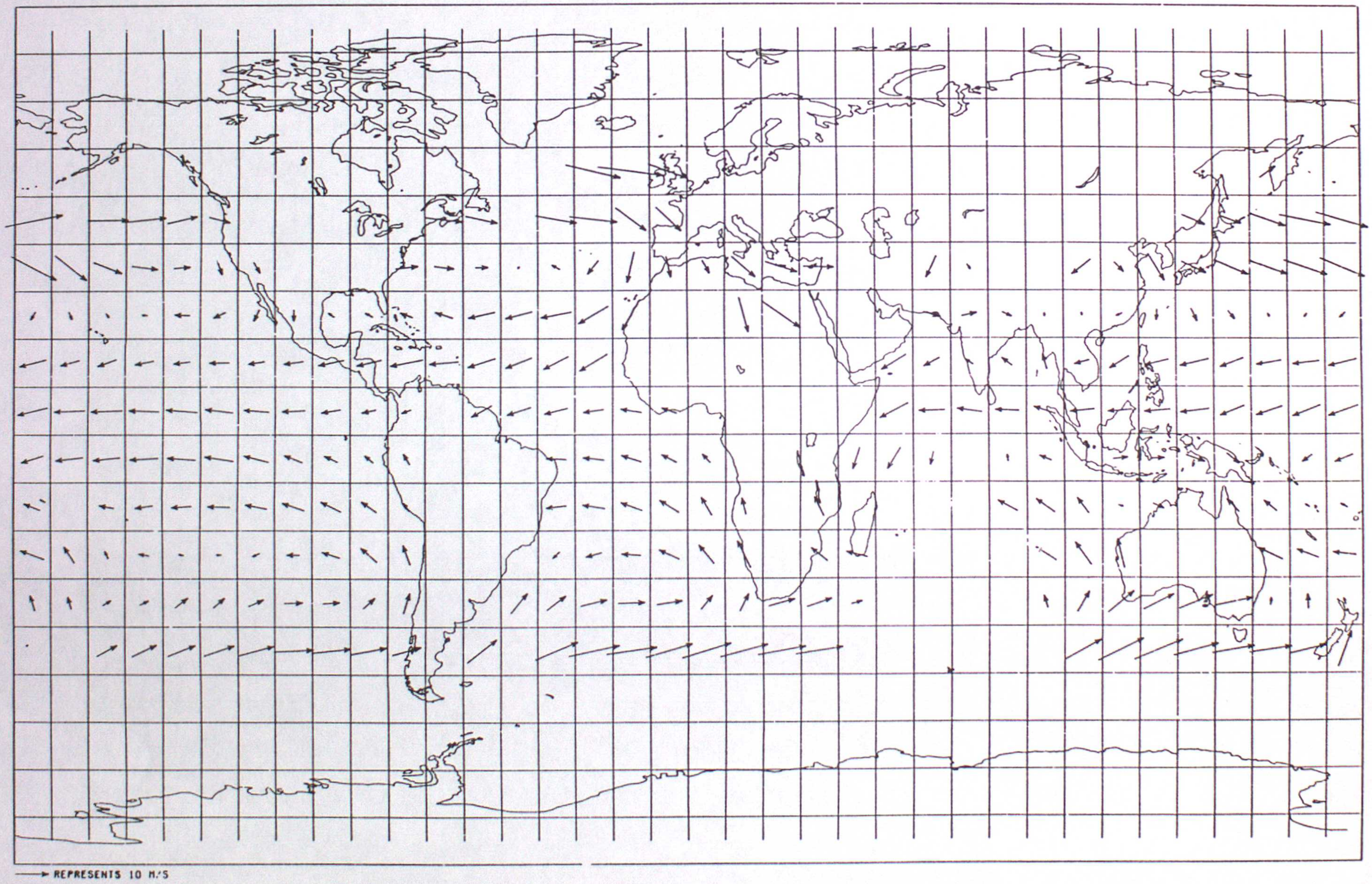
SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA

JANUARY 1994

ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 11


→ REPRESENTS 10 M/S

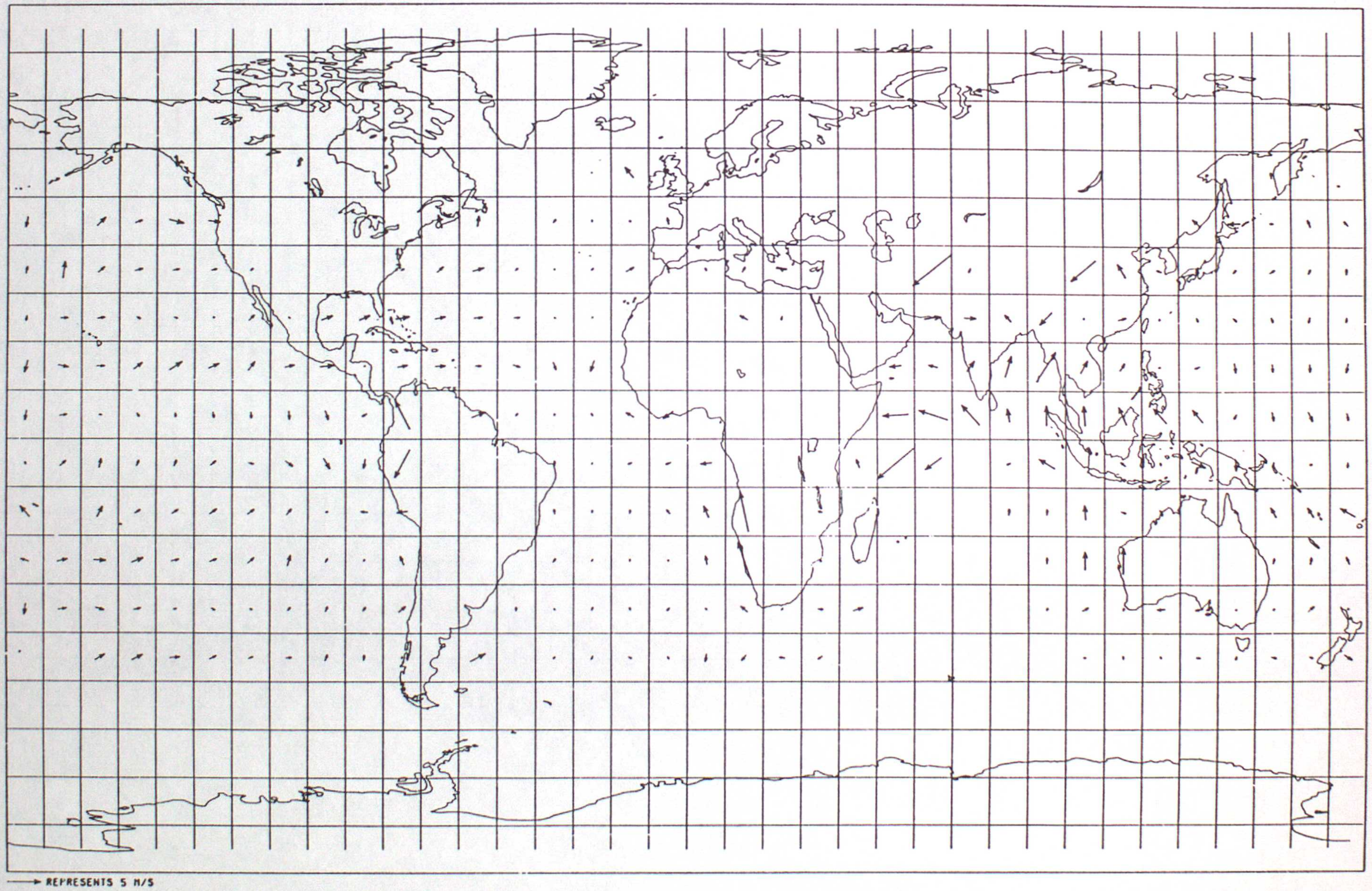
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

JANUARY 1994

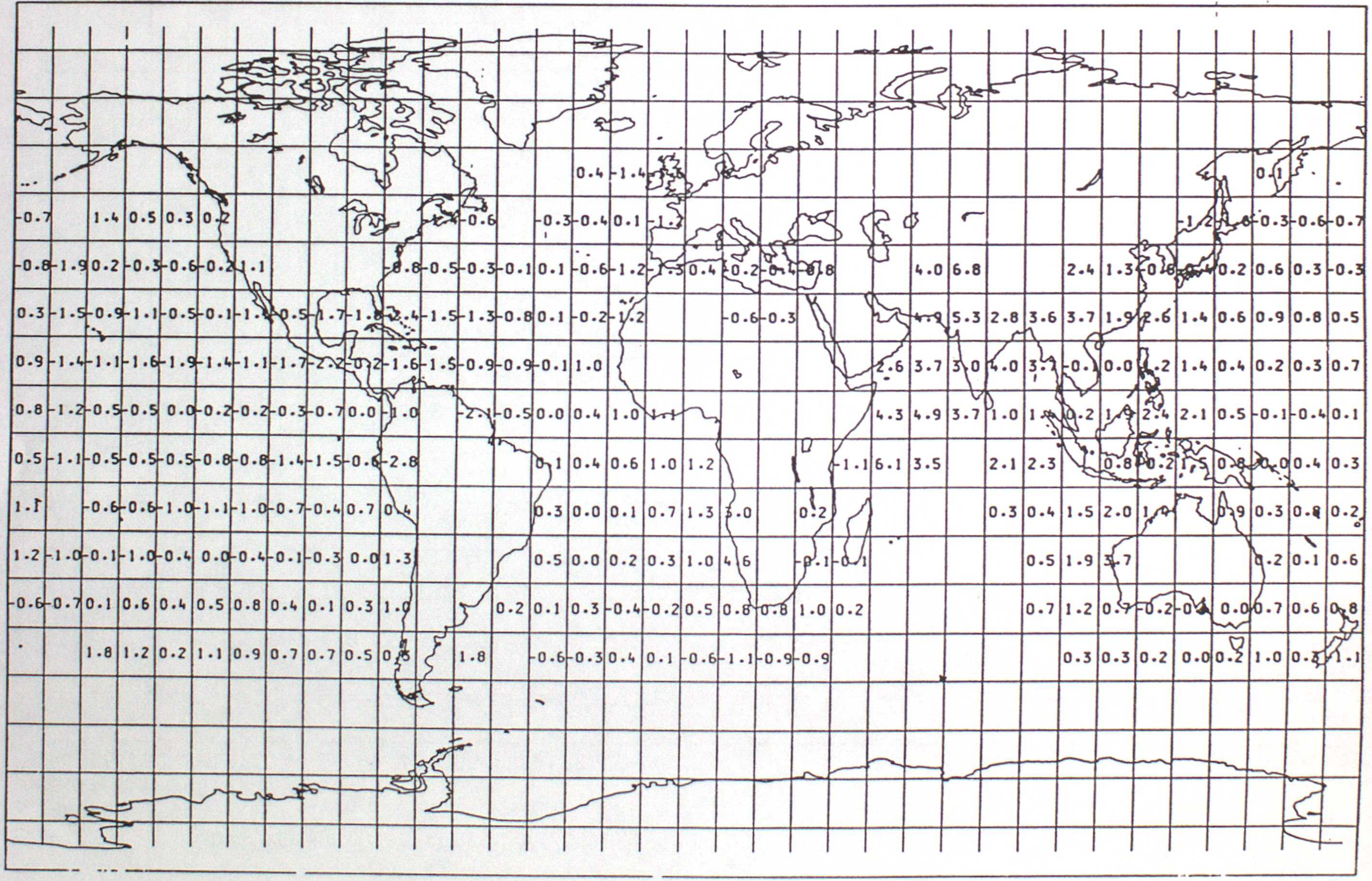
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

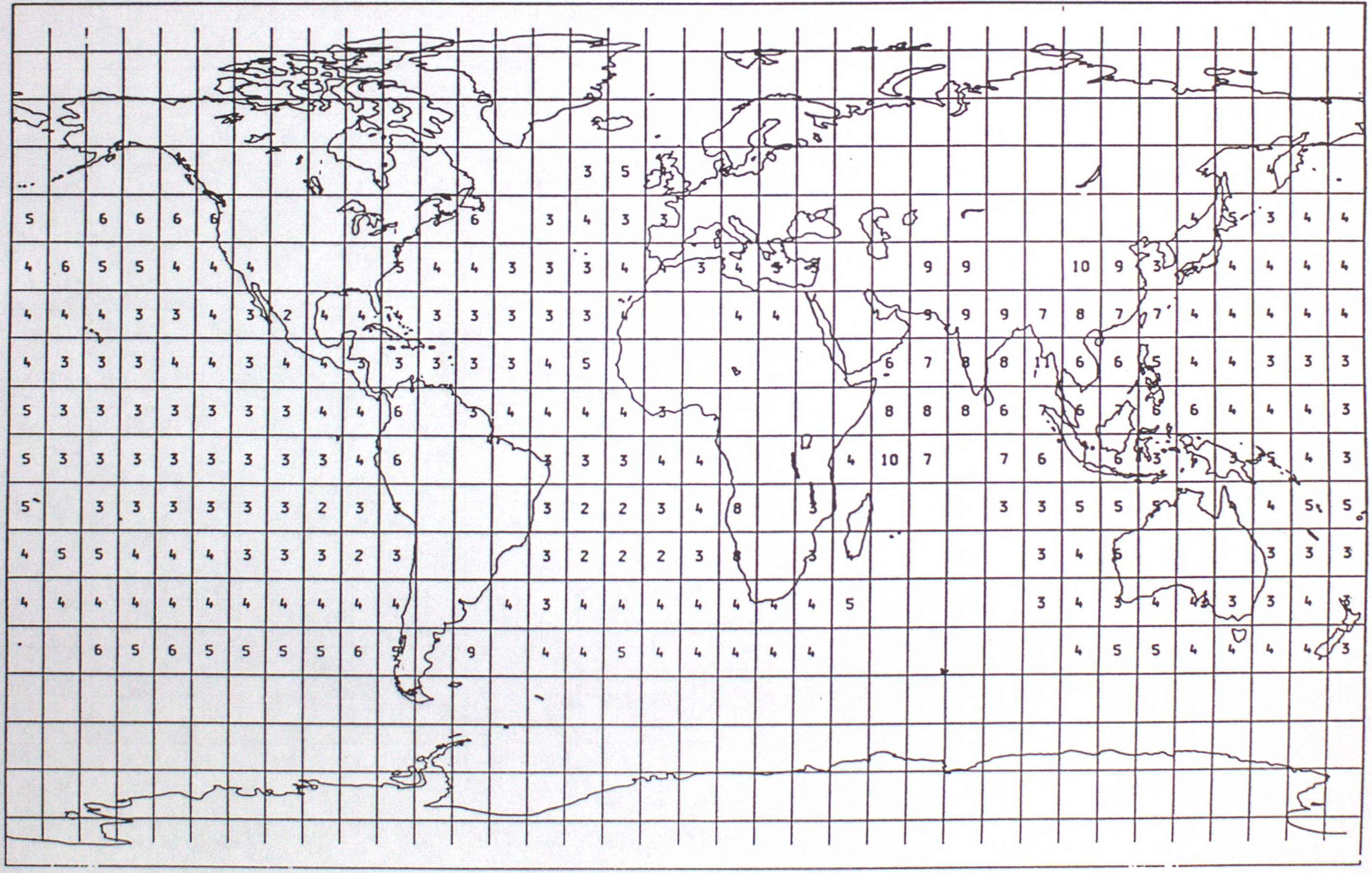
FIGURE 12


REPRESENTS 5 M/S

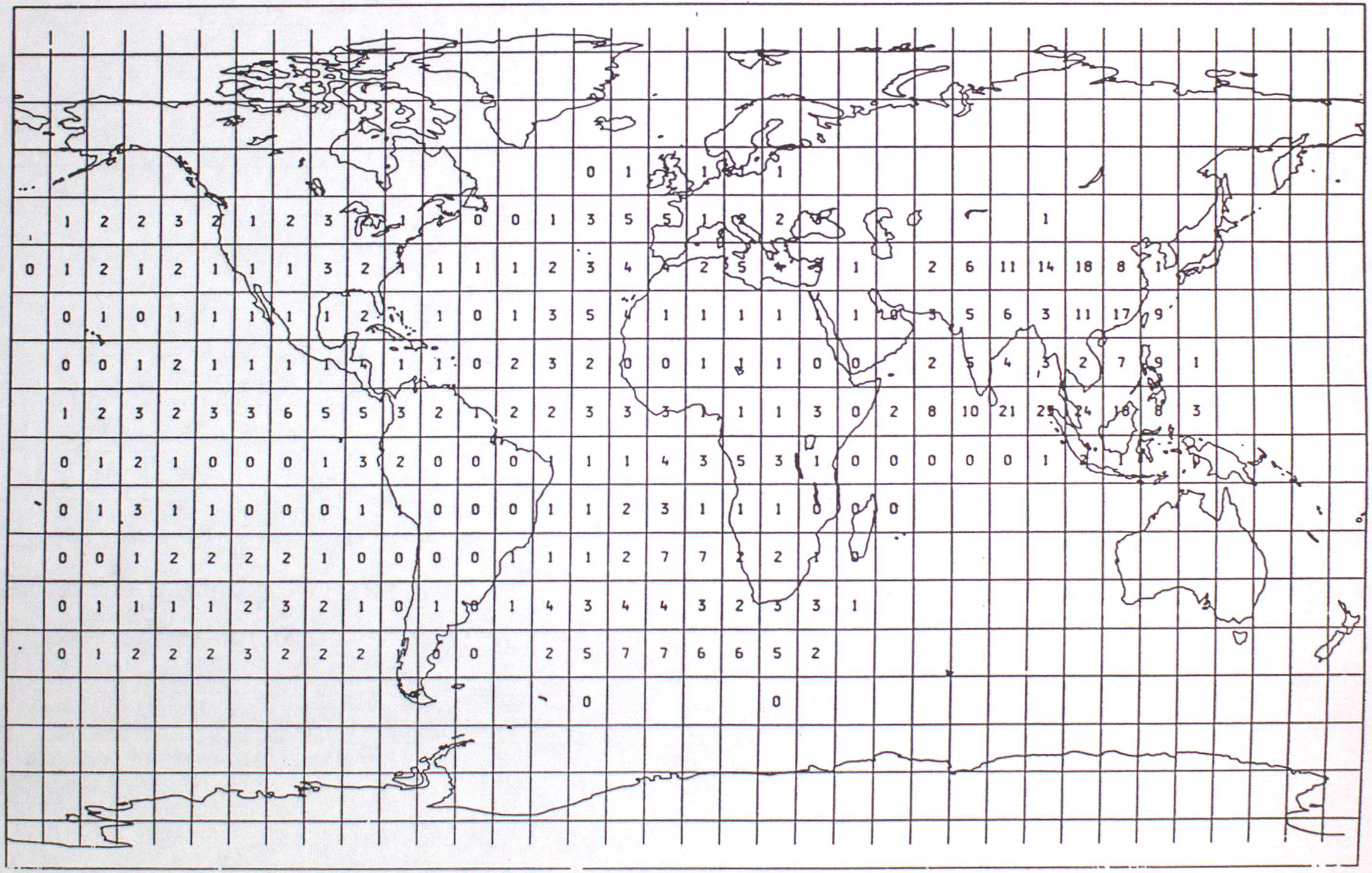
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JANUARY 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


0.4 -1.4 0.1
-0.7 1.4 0.5 0.3 0.2 -0.6 -0.3 -0.4 0.1 -1.2 -1.2 -0.3 -0.6 -0.7
-0.8 -1.9 0.2 -0.3 -0.6 -0.2 1.1 -0.8 -0.5 -0.3 -0.1 0.1 -0.6 -1.2 -1.3 0.4 -0.2 -0.4 -0.8 4.0 6.8 2.4 1.3 -0.6 -0.4 0.2 0.6 0.3 -0.3
0.3 -1.5 -0.9 -1.1 -0.5 -0.1 -1.4 0.5 -1.7 -1.8 -2.4 -1.5 -1.3 -0.8 0.1 -0.2 -1.2 -0.6 -0.3 4.9 5.3 2.8 3.6 3.7 1.9 2.6 1.4 0.6 0.9 0.8 0.5
0.9 -1.4 -1.1 -1.6 -1.9 -1.4 -1.1 -1.7 -2.2 -0.2 -1.6 -1.5 -0.9 -0.9 -0.1 1.0 2.6 3.7 3.0 4.0 3.7 -0.1 0.0 1.2 1.4 0.4 0.2 0.3 0.7
0.8 -1.2 -0.5 -0.5 0.0 -0.2 -0.2 -0.3 -0.7 0.0 -1.0 -2.1 -0.5 0.0 0.4 1.0 1.1 4.3 4.9 3.7 1.0 1.4 0.2 1.9 2.4 2.1 0.5 -0.1 -0.4 0.1
0.5 -1.1 -0.5 -0.5 -0.5 -0.8 -0.8 -1.4 -1.5 -0.6 -2.8 0.1 0.4 0.6 1.0 1.2 -1.1 6.1 3.5 2.1 2.3 0.8 -0.2 1.5 0.8 0.0 0.4 0.3
1.1 -0.6 -0.6 -1.0 -1.1 -1.0 -0.7 -0.4 0.7 0.4 0.3 0.0 0.1 0.7 1.3 3.0 0.2 0.3 0.4 1.5 2.0 1.4 0.9 0.3 0.8 0.2
1.2 -1.0 -0.1 -1.0 -0.4 0.0 -0.4 -0.1 -0.3 0.0 1.3 0.5 0.0 0.2 0.3 1.0 4.6 -0.1 -0.1 0.5 1.9 3.7 0.2 0.1 0.6
-0.6 -0.7 0.1 0.6 0.4 0.5 0.8 0.4 0.1 0.3 1.0 0.2 0.1 0.3 -0.4 -0.2 0.5 0.8 0.8 1.0 0.2 0.7 1.2 0.7 -0.2 -0.4 0.0 0.7 0.6 0.8
1.8 1.2 0.2 1.1 0.9 0.7 0.7 0.5 0.5 1.8 -0.6 -0.3 0.4 0.1 -0.6 -1.1 -0.9 -0.9 0.3 0.3 0.2 0.0 0.2 1.0 0.3 -1.1

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JANUARY 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT

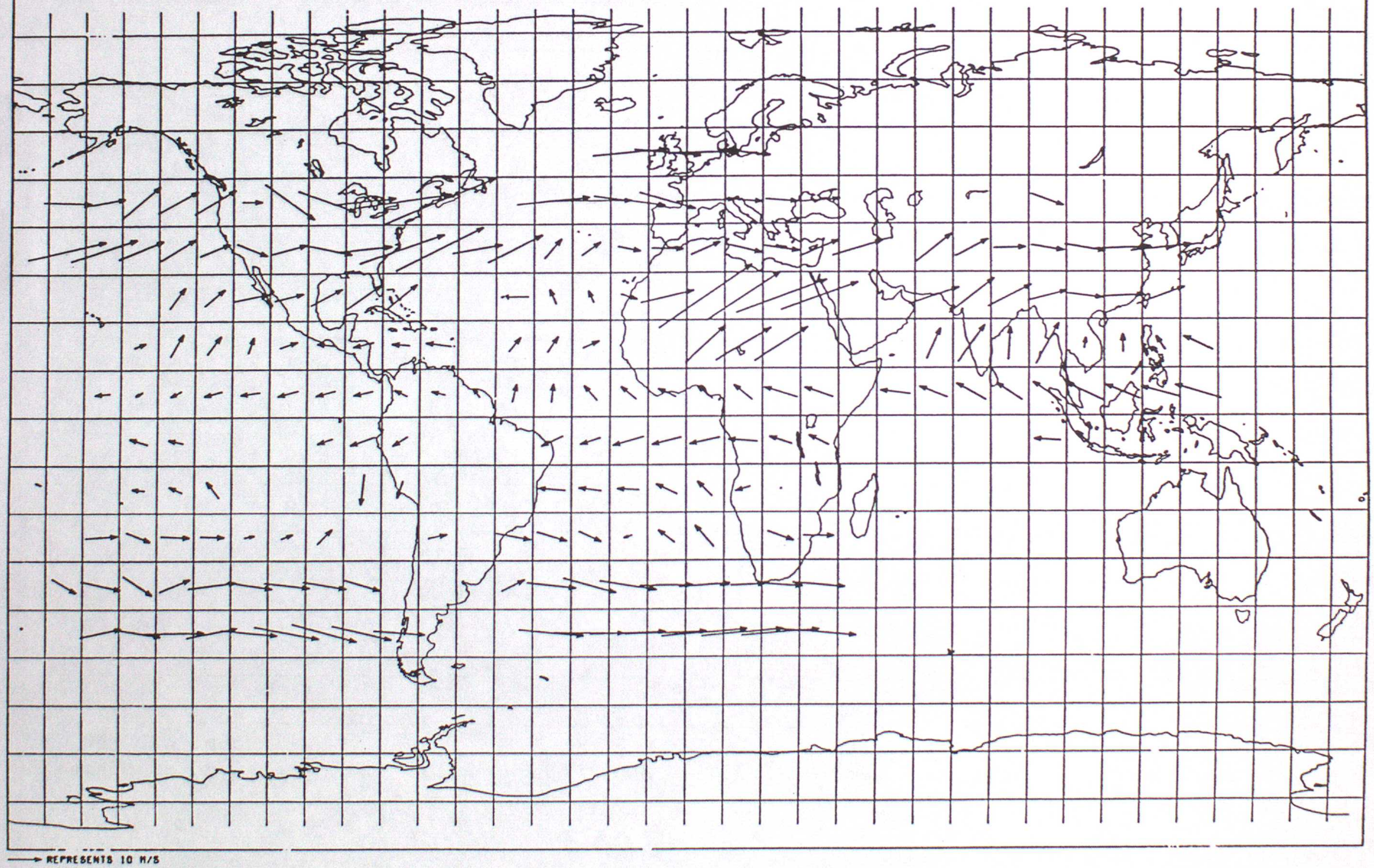

3 5 4
5 6 6 6 6 6 3 4 3 3 4 5 3 4 4
4 6 5 5 4 4 4 5 4 4 3 3 3 4 4 3 4 5 3 9 9 10 9 3 4 4 4 4
4 4 4 3 3 4 3 2 4 4 4 3 3 3 3 3 4 4 4 9 9 9 7 8 7 7 4 4 4 4 4
4 3 3 3 4 4 3 4 4 3 3 3 3 3 4 5 6 7 8 8 11 6 6 5 4 4 3 3 3
5 3 3 3 3 3 3 3 4 4 6 3 4 4 4 4 3 8 8 8 6 7 6 7 6 6 4 4 4 3
5 3 3 3 3 3 3 3 3 4 6 3 3 3 4 4 4 10 7 7 6 6 3 3 5 4 3
5 3 3 3 3 3 3 2 3 3 3 2 2 3 4 8 3 3 3 5 5 5 4 5 5
4 5 5 4 4 4 3 3 3 2 3 3 2 2 2 3 8 3 4 3 4 5 3 3 3
4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 5 3 4 3 4 4 3 3 4 3
6 5 6 5 5 5 5 6 5 9 4 4 5 4 4 4 4 4 4 5 5 4 4 4 4 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JANUARY 1994


0 1 1 1
1 2 2 3 2 1 2 3 1 0 0 1 3 5 5 1 2 2 1
0 1 2 1 2 1 1 1 3 2 1 1 1 1 2 3 4 4 2 5 4 5 1 2 6 11 14 18 8 1
0 1 0 1 1 1 1 1 2 1 1 0 1 3 5 4 1 1 1 1 1 1 0 3 5 6 3 11 17 9
0 0 1 2 1 1 1 1 4 1 1 0 2 3 2 0 0 1 1 1 0 0 2 5 4 3 2 7 9 1
1 2 3 2 3 3 6 5 5 3 2 1 2 2 3 3 3 1 1 1 3 0 2 8 10 21 25 24 18 8 3
0 1 2 1 0 0 0 1 3 2 0 0 0 1 1 1 4 3 5 3 1 0 0 0 0 0 1 2 1
0 1 3 1 1 0 0 0 1 1 0 0 0 1 1 2 3 1 1 1 0 0 0
0 0 1 2 2 2 2 1 0 0 0 0 1 1 1 2 7 7 2 2 1 0
0 1 1 1 1 2 3 2 1 0 1 0 1 4 3 4 4 3 2 3 3 1
0 1 2 2 2 3 2 2 2 1 0 0 2 5 7 7 6 6 5 2
0 0

SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
JANUARY 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 16


→ REPRESENTS 10 M/S

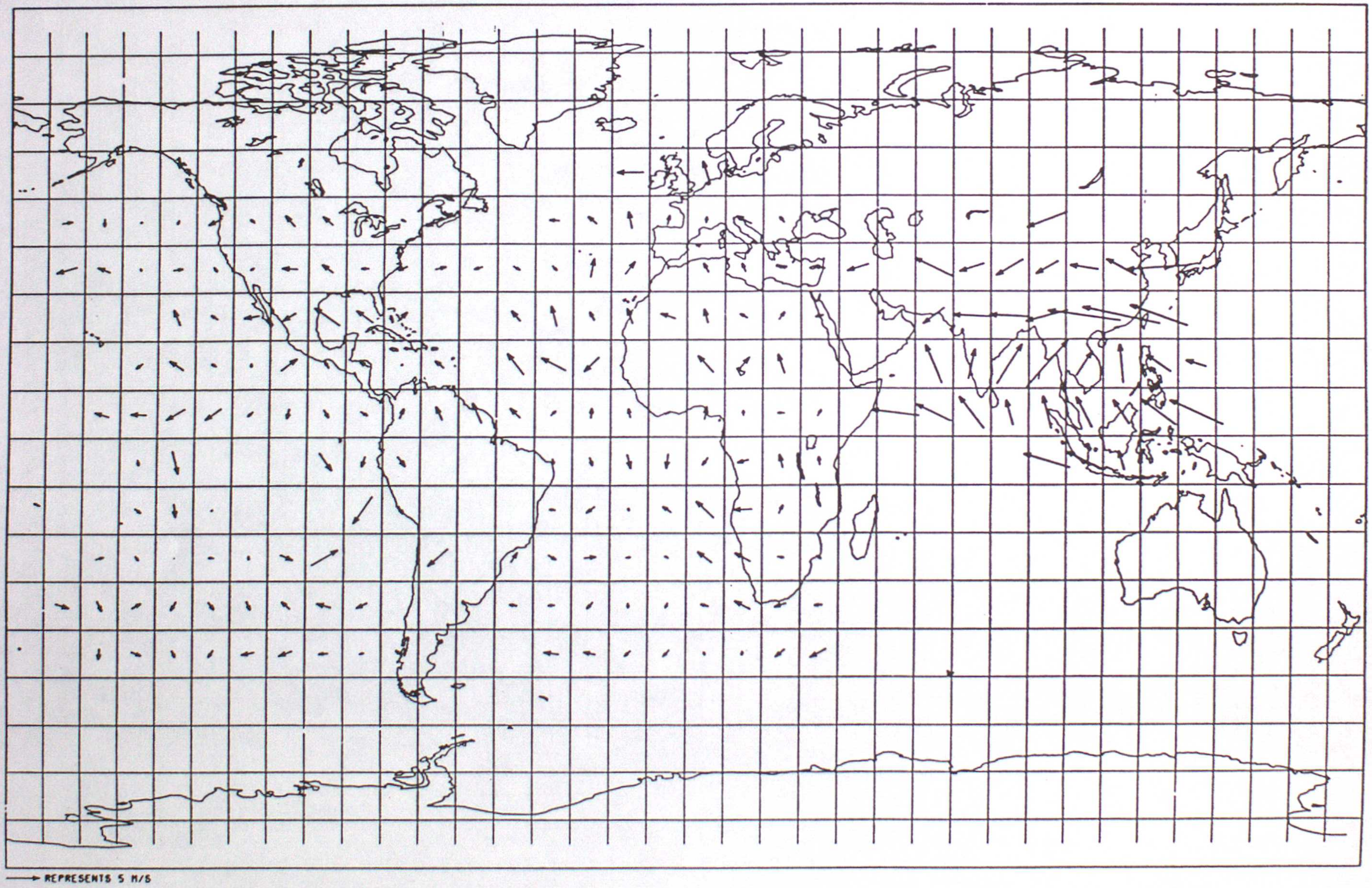
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

JANUARY 1994

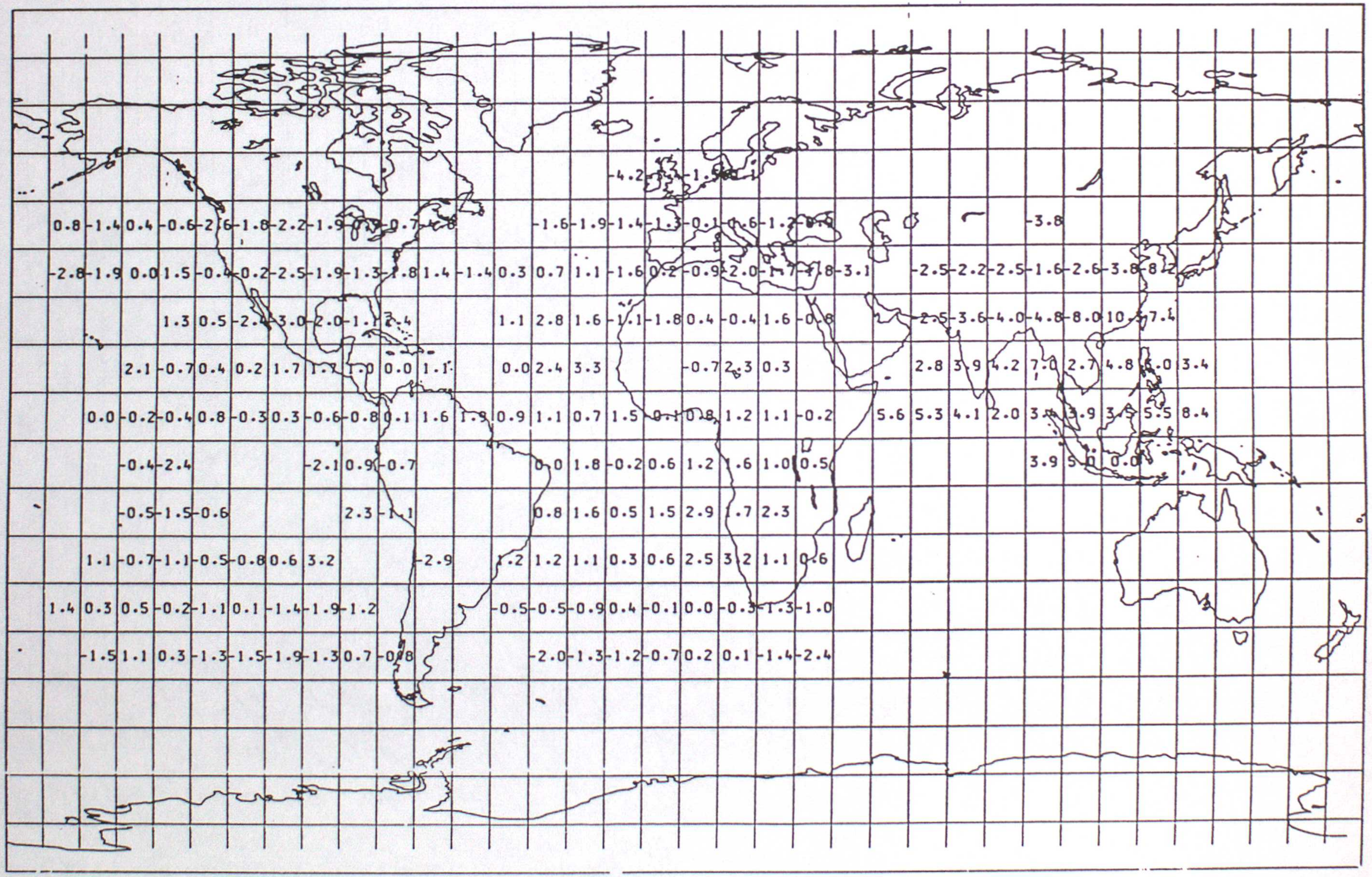
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 17


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JANUARY 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT

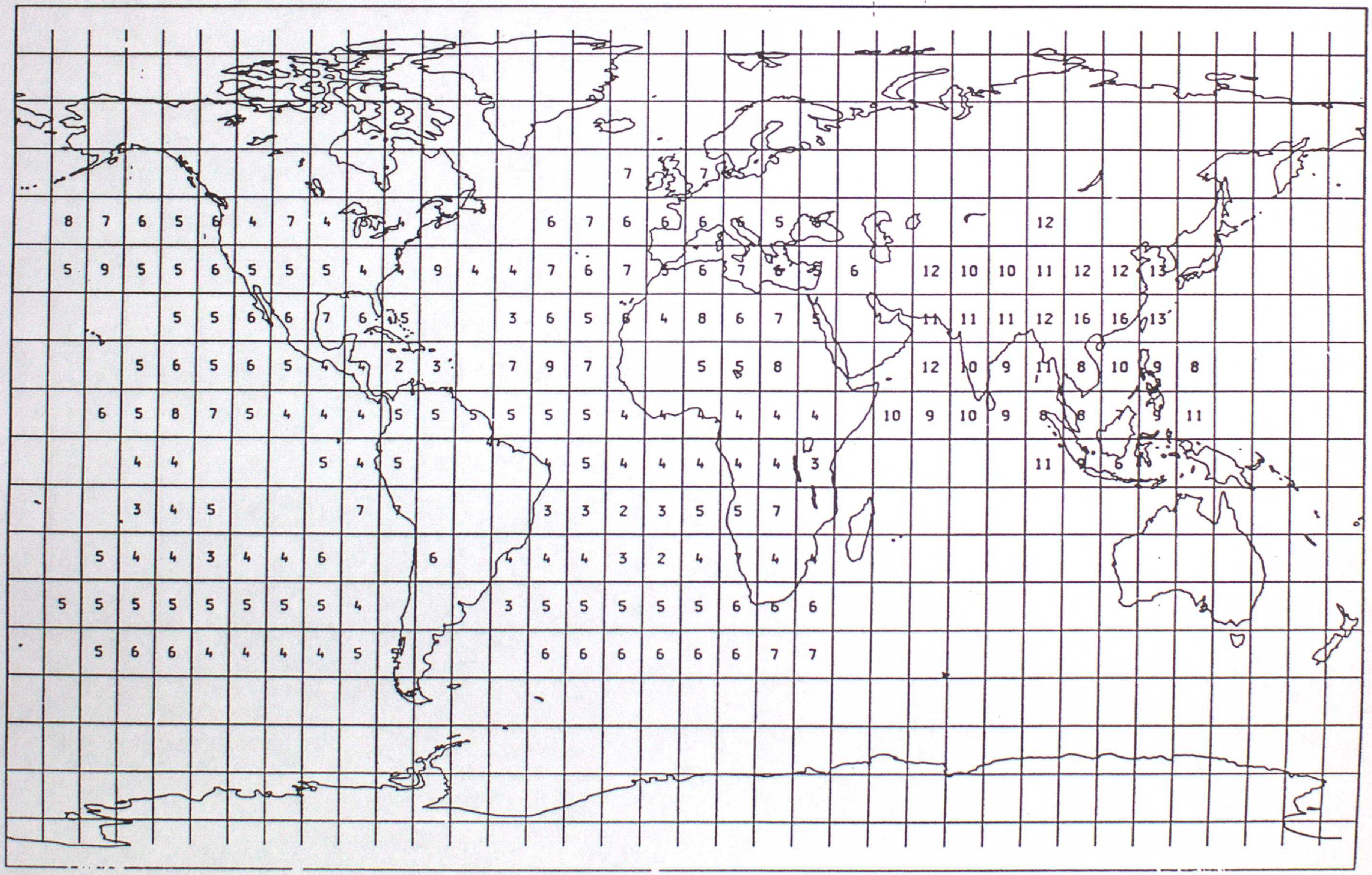

-4.2 -1.5
0.8 -1.4 0.4 -0.6 -2.6 -1.8 -2.2 -1.9 -0.7 -1.6 -1.9 -1.4 -1.3 -0.1 -1.6 -1.2 -3.8
-2.8 -1.9 0.0 1.5 -0.4 -0.2 -2.5 -1.9 -1.3 -1.8 1.4 -1.4 0.3 0.7 1.1 -1.6 0.2 -0.9 -2.0 -1.7 -1.8 -3.1 -2.5 -2.2 -2.5 -1.6 -2.6 -3.8 -8.2
1.3 0.5 -2.4 -3.0 -2.0 -1.1 -2.4 1.1 2.8 1.6 -1.1 -1.8 0.4 -0.4 1.6 -0.8 -2.5 -3.6 -4.0 -4.8 -8.0 10.5 7.4
2.1 -0.7 0.4 0.2 1.7 1.7 1.0 0.0 1.1 0.0 2.4 3.3 -0.7 2.3 0.3 2.8 3.9 4.2 7.0 2.7 4.8 6.0 3.4
0.0 -0.2 -0.4 0.8 -0.3 0.3 -0.6 -0.8 0.1 1.6 1.9 0.9 1.1 0.7 1.5 -0.1 0.8 1.2 1.1 -0.2 5.6 5.3 4.1 2.0 3.4 3.9 3.5 5.5 8.4
-0.4 -2.4 -2.1 0.9 -0.7 0.0 1.8 -0.2 0.6 1.2 1.6 1.0 0.5 3.9 5.0 0.0
-0.5 -1.5 -0.6 2.3 -1.1 0.8 1.6 0.5 1.5 2.9 1.7 2.3
1.1 -0.7 -1.1 -0.5 -0.8 0.6 3.2 -2.9 1.2 1.2 1.1 0.3 0.6 2.5 3.2 1.1 0.6
1.4 0.3 0.5 -0.2 -1.1 0.1 -1.4 -1.9 -1.2 -0.5 -0.5 -0.9 0.4 -0.1 0.0 -0.3 -1.3 -1.0
-1.5 1.1 0.3 -1.3 -1.5 -1.9 -1.3 0.7 -0.8 -2.0 -1.3 -1.2 -0.7 0.2 0.1 -1.4 -2.4

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19

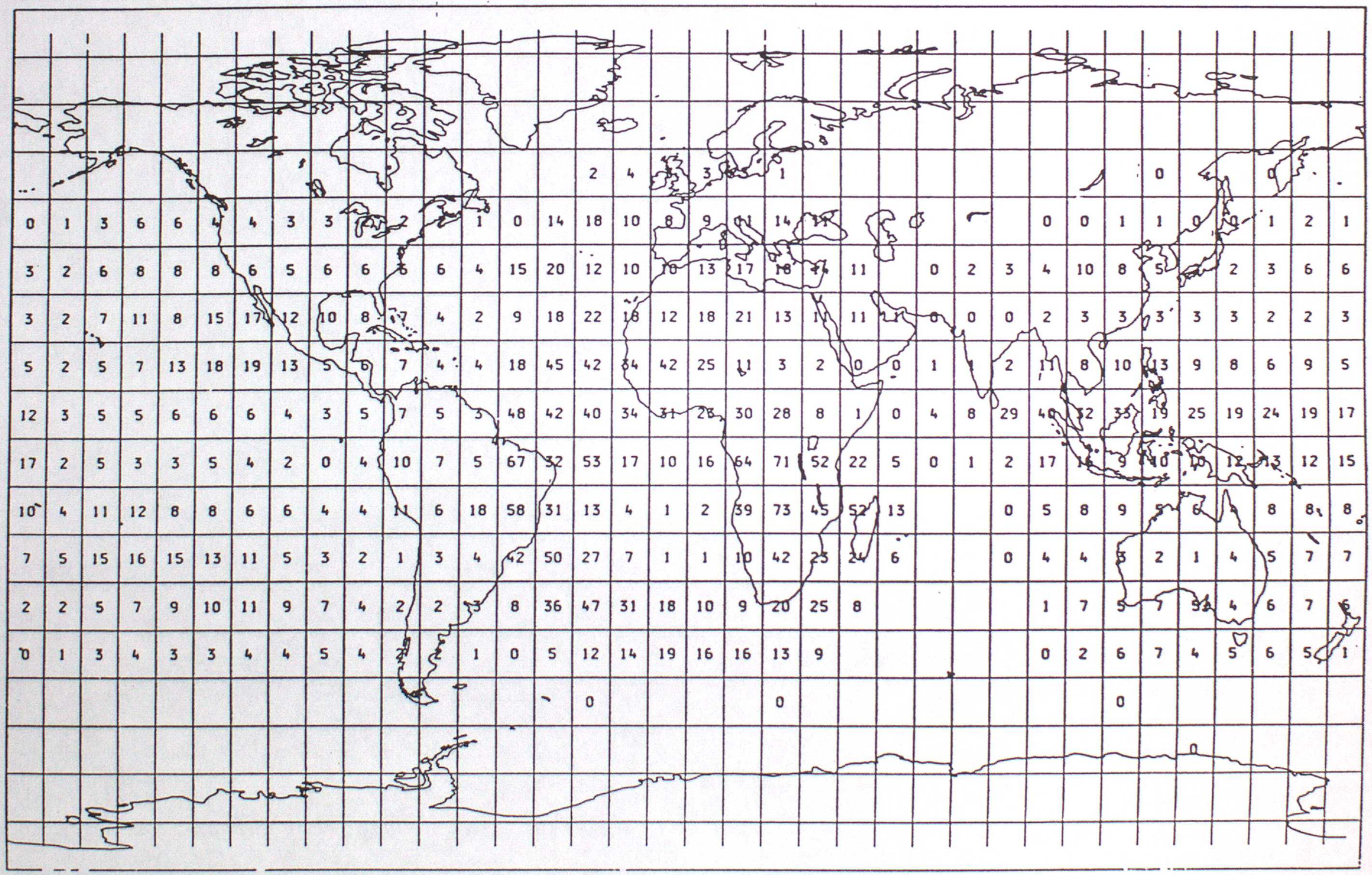
JANUARY 1994

USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT

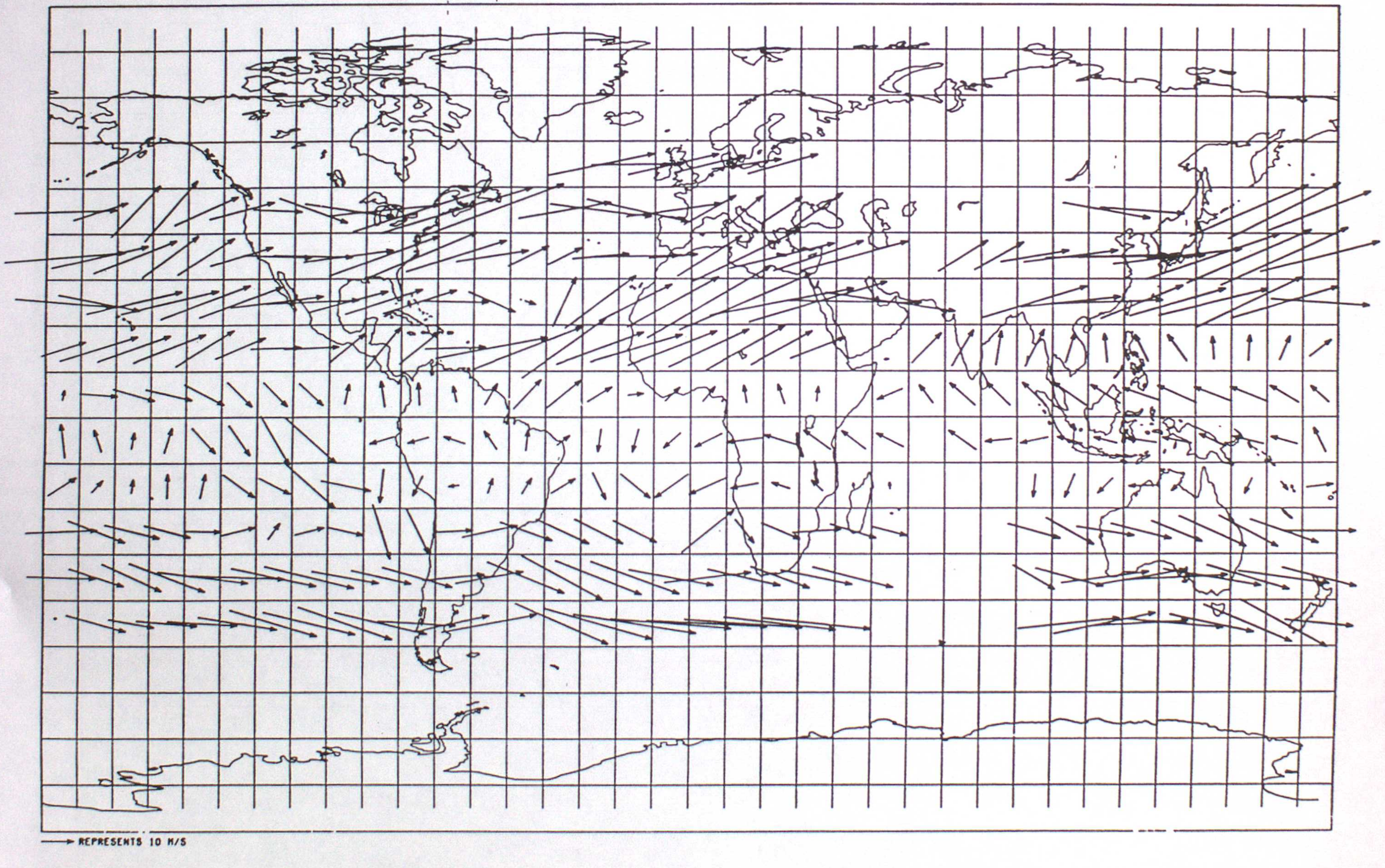

7 7
8 7 6 5 6 4 7 4 4 6 7 6 6 6 6 5 12
5 9 5 5 6 5 5 5 4 4 9 4 4 7 6 7 5 6 7 6 5 6 12 10 10 11 12 12 13
5 5 6 6 7 6 15 3 6 5 6 4 8 6 7 5 11 11 11 12 16 16 13
5 6 5 6 5 4 4 2 3 7 9 7 5 5 8 12 10 9 11 8 10 9 8
6 5 8 7 5 4 4 4 5 5 5 5 5 4 4 4 4 4 4 10 9 10 9 8 8 7 9 11
4 4 5 4 5 4 5 4 4 4 4 4 3 11 6
3 4 5 7 7 3 3 2 3 5 5 7
5 4 4 3 4 4 6 6 4 4 4 3 2 4 4 4 4
5 5 5 5 5 5 5 5 4 3 5 5 5 5 5 6 6 6
5 6 6 4 4 4 4 5 6 6 6 6 6 6 7 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JANUARY 1994


2 4 3 3 1 0 0
0 1 3 6 6 4 4 3 3 2 2 1 0 14 18 10 8 9 11 14 11 0 0 1 1 0 0 1 2 1
3 2 6 8 8 8 6 5 6 6 6 6 4 15 20 12 10 10 13 17 18 4 11 0 2 3 4 10 8 5 2 3 6 6
3 2 7 11 8 15 17 12 10 8 7 4 2 9 18 22 18 12 18 21 13 11 11 11 0 0 0 2 3 3 3 3 3 2 2 3
5 2 5 7 13 18 19 13 5 6 7 4 4 18 45 42 34 42 25 11 3 2 0 0 1 1 2 11 8 10 13 9 8 6 9 5
12 3 5 5 6 6 6 4 3 5 7 5 3 48 42 40 34 31 28 30 28 8 1 0 4 8 29 40 32 33 19 25 19 24 19 17
17 2 5 3 3 5 4 2 0 4 10 7 5 67 32 53 17 10 16 64 71 52 22 5 0 1 2 17 14 9 10 10 12 13 12 15
10 4 11 12 8 8 6 6 4 4 11 6 18 58 31 13 4 1 2 39 73 45 52 13 0 5 8 9 5 6 4 8 8 8
7 5 15 16 15 13 11 5 3 2 1 3 4 42 50 27 7 1 1 10 42 23 24 6 0 4 4 3 2 1 4 5 7 7
2 2 5 7 9 10 11 9 7 4 2 2 3 8 36 47 31 18 10 9 20 25 8 1 7 5 7 53 4 6 7 6
0 1 3 4 3 3 4 4 5 4 2 2 1 0 5 12 14 19 16 16 13 9 0 2 6 7 4 5 6 5 1
0 0 0
0

SATOB VECTOR MEAN WINDS BETWEEN 101-400 HPA
JANUARY 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 21


→ REPRESENTS 10 M/S

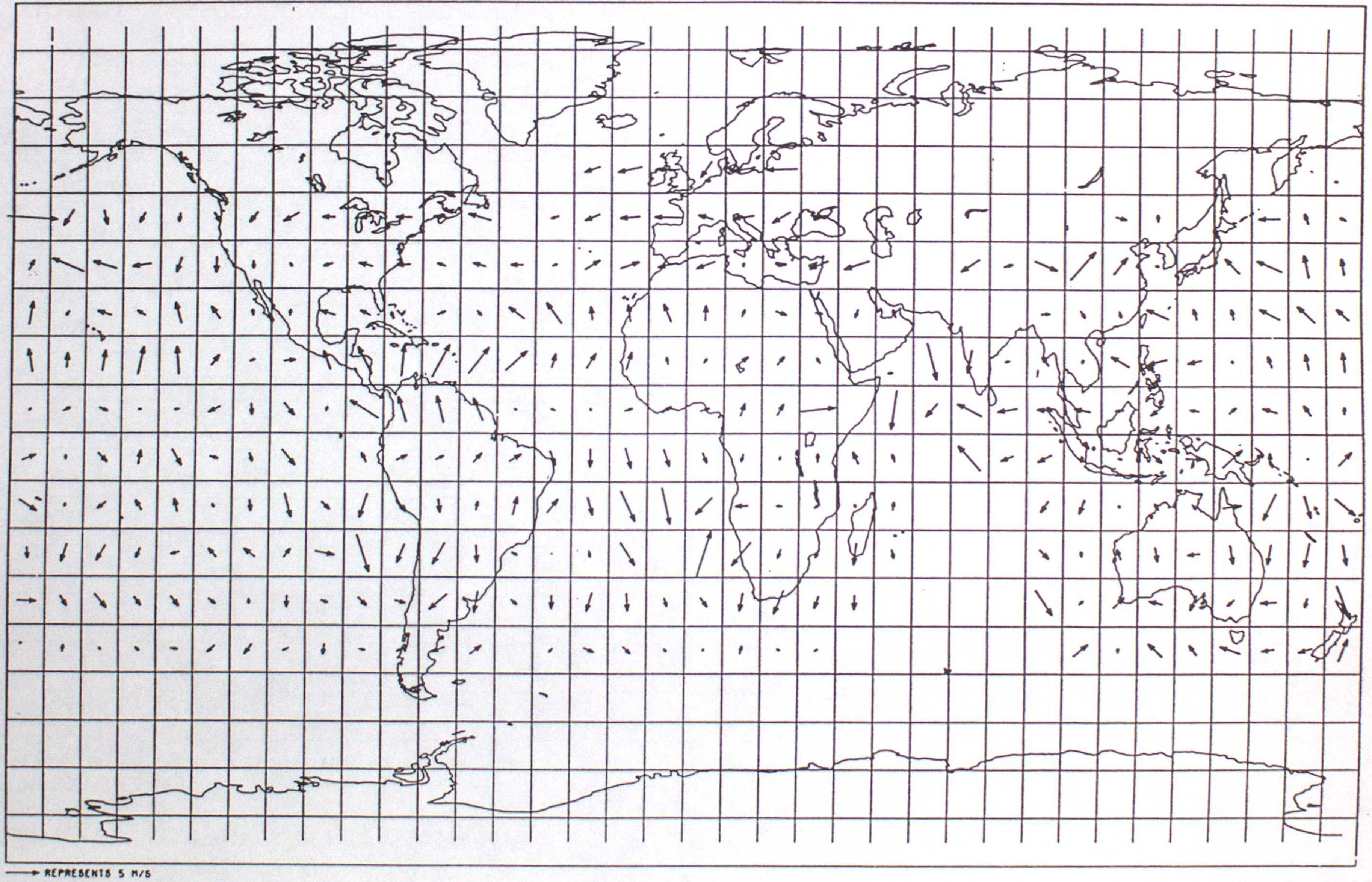
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

JANUARY 1994

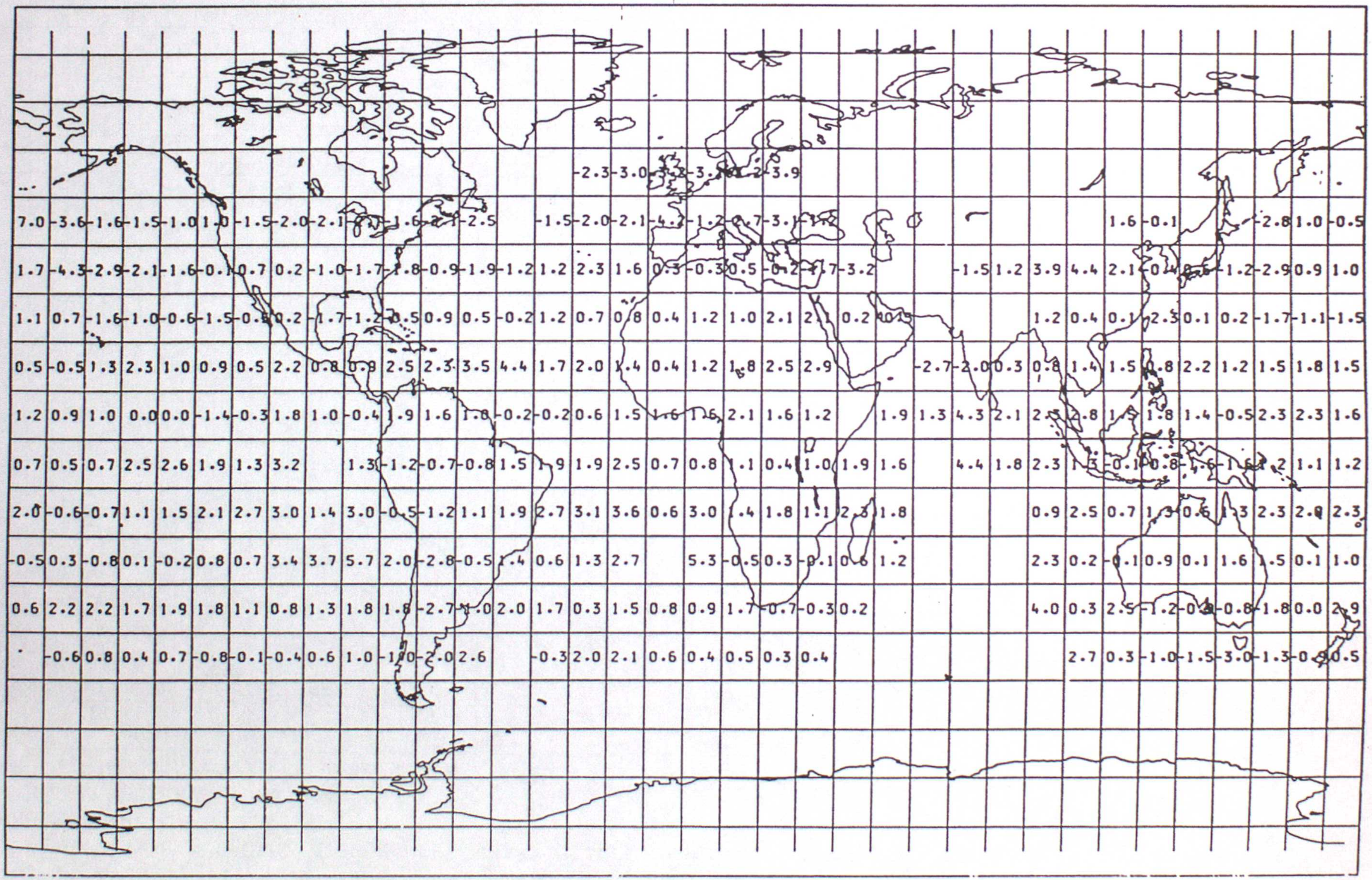
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

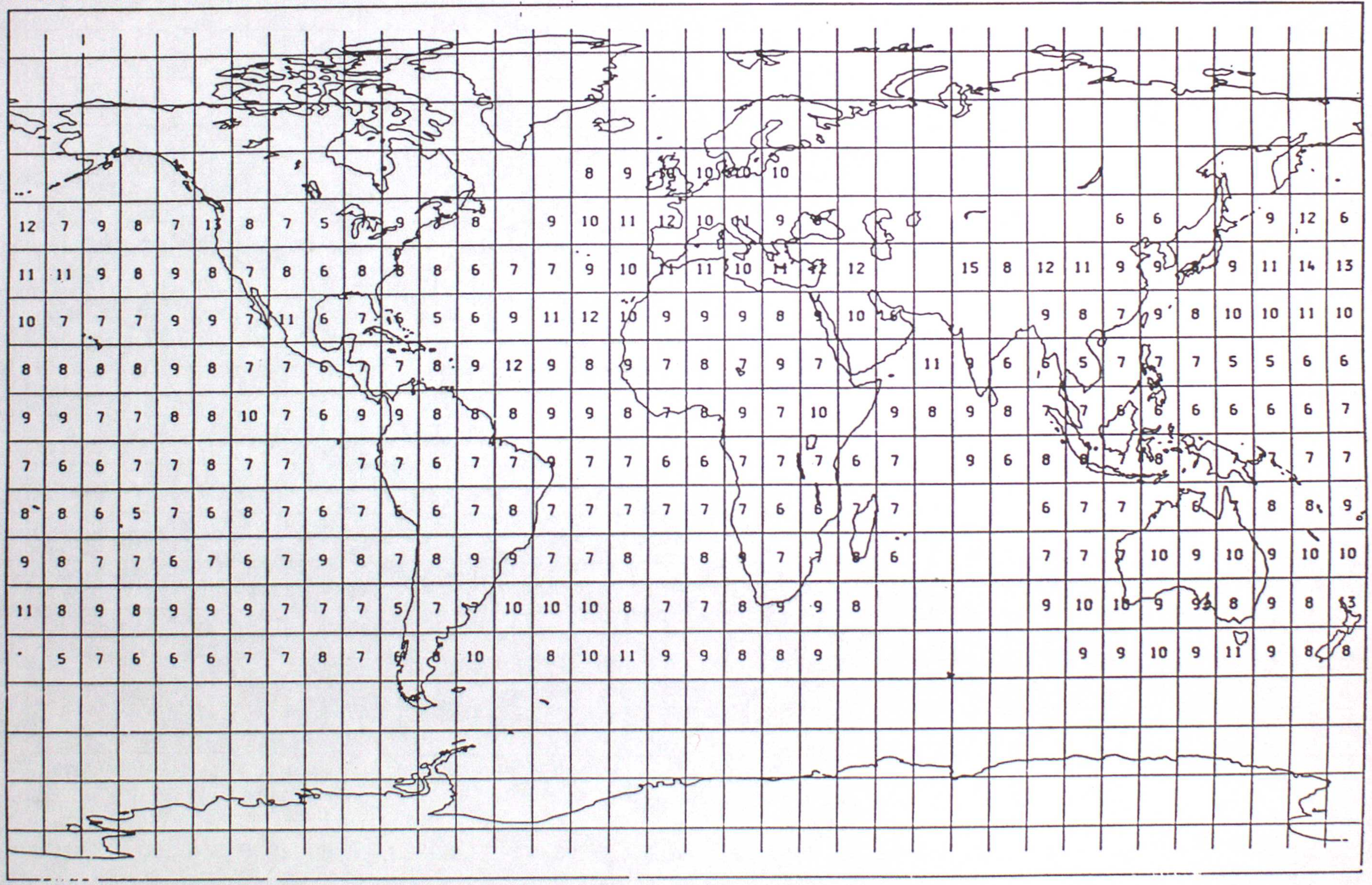
FIGURE 22


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JANUARY 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-2.3 -3.0 -3.9
7.0 -3.6 -1.6 -1.5 -1.0 1.0 -1.5 -2.0 -2.1 -1.6 -2.5 -1.5 -2.0 -2.1 -4.2 -1.2 -2.7 -3.1 1.6 -0.1 -2.8 1.0 -0.5
1.7 -4.3 -2.9 -2.1 -1.6 -0.1 0.7 0.2 -1.0 -1.7 -1.8 -0.9 -1.9 -1.2 1.2 2.3 1.6 0.3 -0.3 0.5 -0.2 -1.7 -3.2 -1.5 1.2 3.9 4.4 2.1 -0.4 0.6 -1.2 -2.9 0.9 1.0
1.1 0.7 -1.6 -1.0 -0.6 -1.5 -0.5 0.2 -1.7 -1.2 0.5 0.9 0.5 -0.2 1.2 0.7 0.8 0.4 1.2 1.0 2.1 2.1 0.2 1.2 0.4 0.1 2.3 0.1 0.2 -1.7 -1.1 -1.5
0.5 -0.5 1.3 2.3 1.0 0.9 0.5 2.2 0.8 0.9 2.5 2.3 3.5 4.4 1.7 2.0 1.4 0.4 1.2 1.8 2.5 2.9 -2.7 -2.0 0.3 0.8 1.4 1.5 0.8 2.2 1.2 1.5 1.8 1.5
1.2 0.9 1.0 0.0 0.0 -1.4 -0.3 1.8 1.0 -0.4 1.9 1.6 1.0 -0.2 -0.2 0.6 1.5 1.6 1.6 2.1 1.6 1.2 1.9 1.3 4.3 2.1 2.3 2.8 1.5 1.8 1.4 -0.5 2.3 2.3 1.6
0.7 0.5 0.7 2.5 2.6 1.9 1.3 3.2 1.3 -1.2 -0.7 -0.8 1.5 1.9 1.9 2.5 0.7 0.8 1.1 0.4 1.0 1.9 1.6 4.4 1.8 2.3 1.3 -0.1 0.8 -1.6 -1.6 1.2 1.1 1.2
2.0 -0.6 -0.7 1.1 1.5 2.1 2.7 3.0 1.4 3.0 -0.5 -1.2 1.1 1.9 2.7 3.1 3.6 0.6 3.0 1.4 1.8 1.1 2.3 1.8 0.9 2.5 0.7 1.3 0.6 1.3 2.3 2.0 2.3
-0.5 0.3 -0.8 0.1 -0.2 0.8 0.7 3.4 3.7 5.7 2.0 -2.8 -0.5 1.4 0.6 1.3 2.7 5.3 -0.5 0.3 -0.1 0.6 1.2 2.3 0.2 -0.1 0.9 0.1 1.6 1.5 0.1 1.0
0.6 2.2 2.2 1.7 1.9 1.8 1.1 0.8 1.3 1.8 1.8 -2.7 -1.0 2.0 1.7 0.3 1.5 0.8 0.9 1.7 -0.7 -0.3 0.2 4.0 0.3 2.5 -1.2 -0.3 -0.8 -1.8 0.0 2.9
-0.6 0.8 0.4 0.7 -0.8 -0.1 -0.4 0.6 1.0 -1.0 -2.0 2.6 -0.3 2.0 2.1 0.6 0.4 0.5 0.3 0.4 2.7 0.3 -1.0 -1.5 -3.0 -1.3 -0.9 0.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JANUARY 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT



## MONITORING OF SATELLITE TEMPERATURES

## MONITORING CENTRE: BRACKNELL

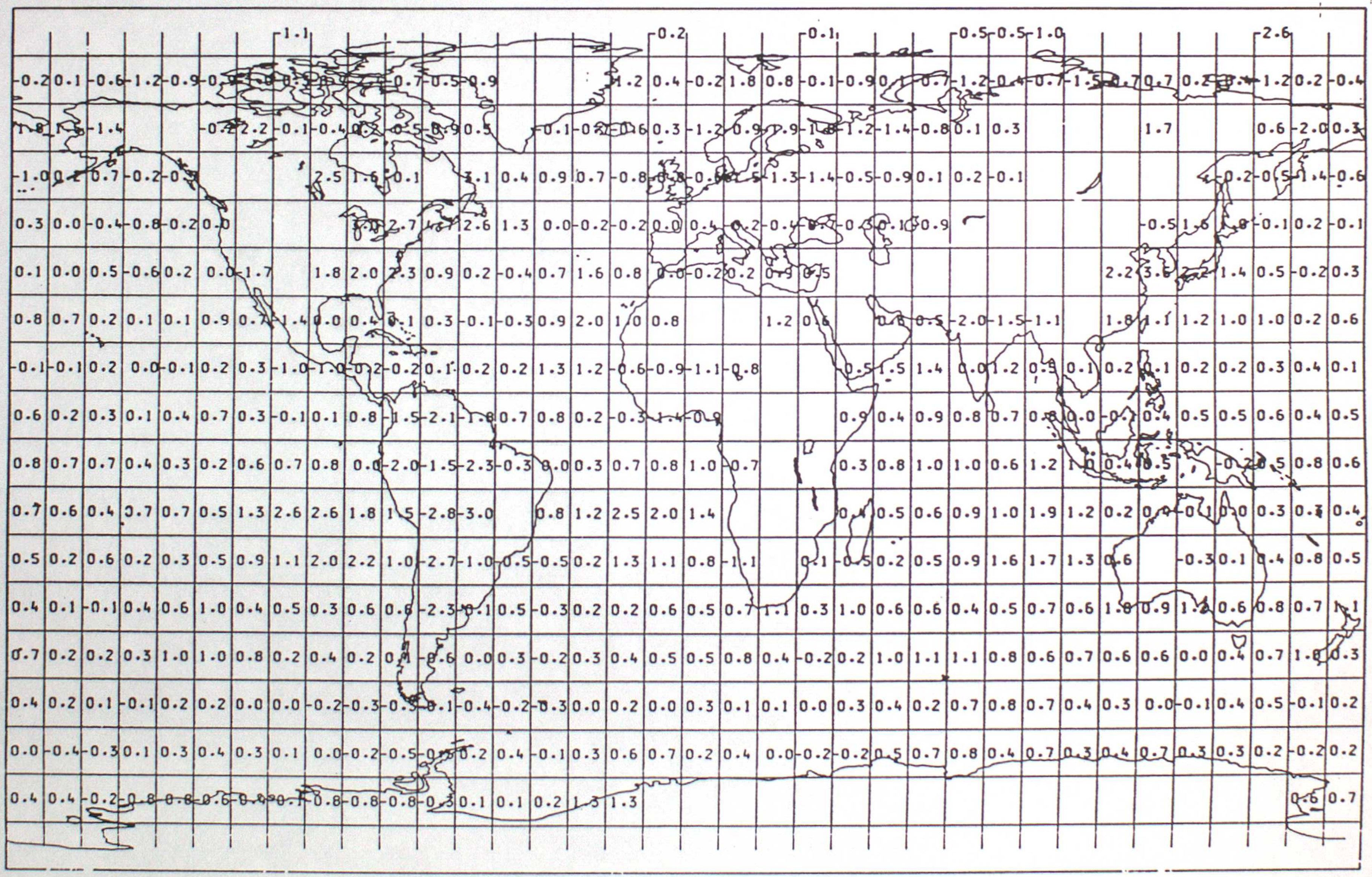
## MONTH:January, 94

**Monitoring procedures**

| | |
|---|---|
| **Period** | :One calendar month. |
| **Data monitored** | :Reports from NOAA-11, NOAA-12 500 km. |
| **Standard of comparison** | :Background field from Bracknell global model. |
| **Selection Criteria** | :All SATEM soundings where number of observations > 30. |
| **Data Extracted** | :Layer: 850 - 1000 hPa<br>100 - 300 hPa<br>30 - 50 hPa<br>:Mean observation minus background temperature differences |

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
JANUARY 1994
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 25



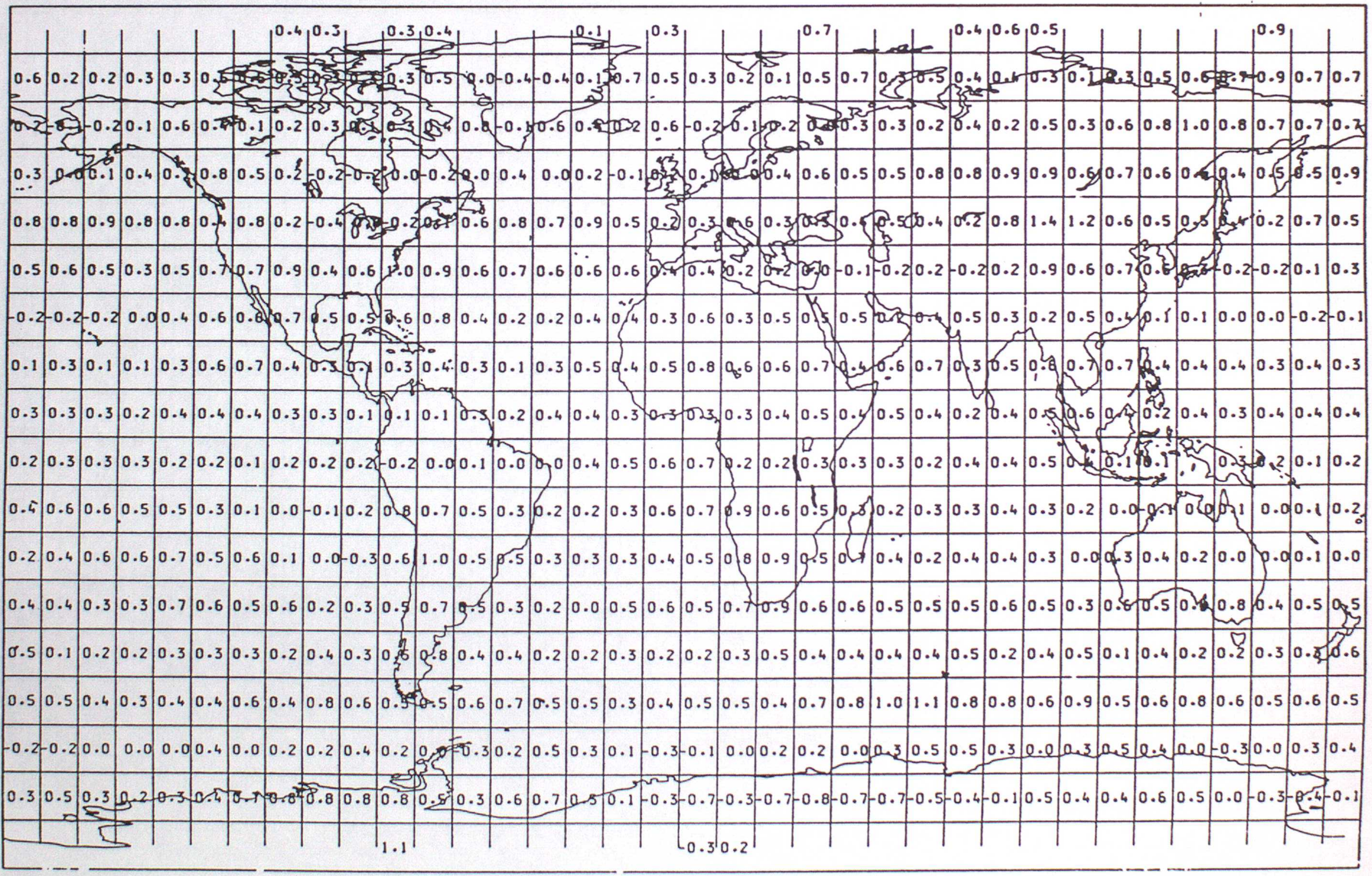
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA

JANUARY 1994

FIGURE 26

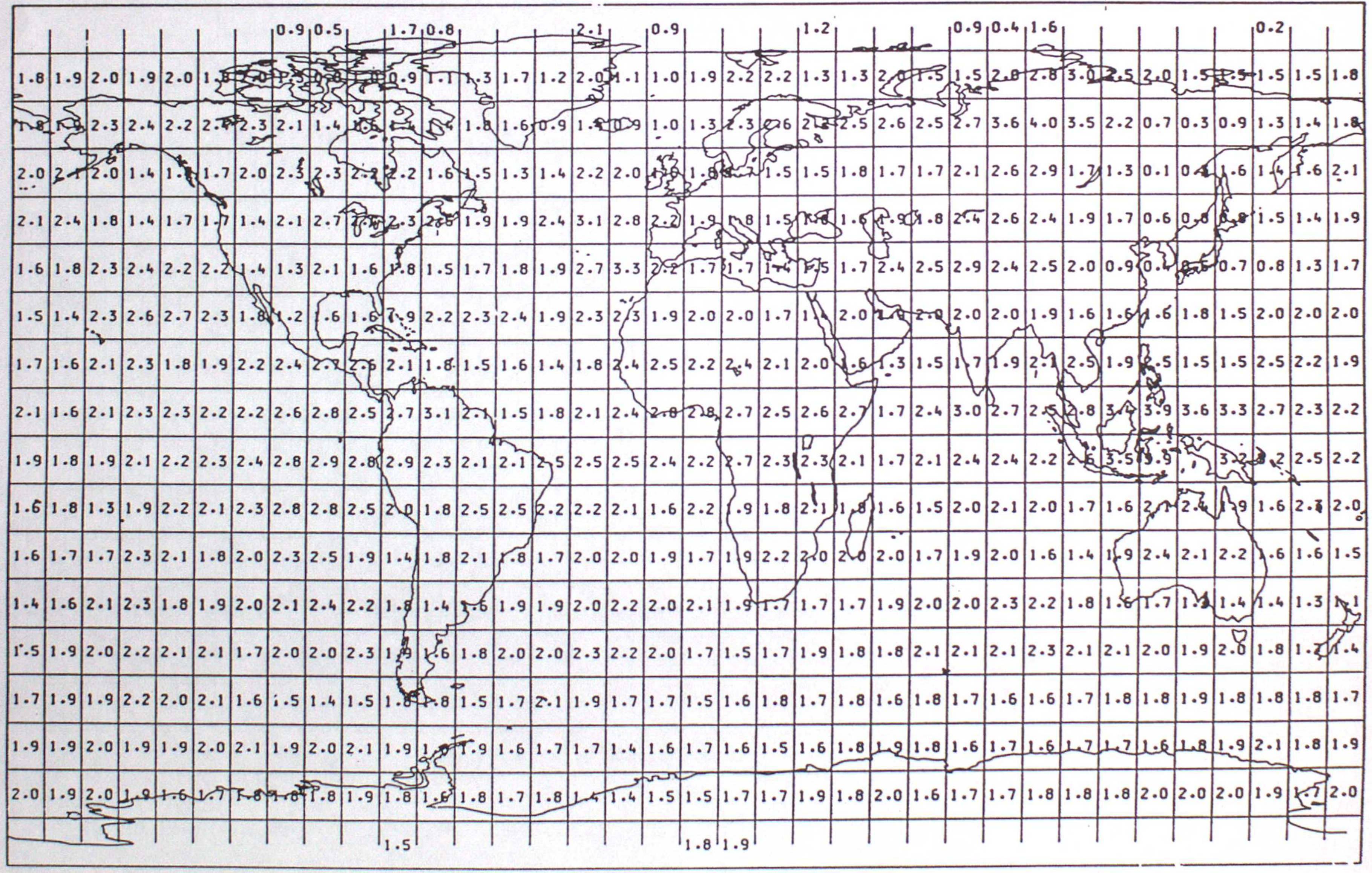
NOAA-11. USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


0.4 0.3 0.3 0.4 0.1 0.3 0.7 0.4 0.6 0.5 0.9
0.6 0.2 0.2 0.3 0.3 0.3 0.5 0.0 -0.4 -0.4 0.1 0.7 0.5 0.3 0.2 0.1 0.5 0.7 0.5 0.4 0.3 0.5 -0.9 0.7 0.7
-0.2 0.1 0.6 0.1 0.2 0.3 -0.6 0.6 -0.2 0.3 0.3 0.2 0.4 0.2 0.5 0.3 0.6 0.8 1.0 0.8 0.7 0.7
0.3 0.1 0.4 0.8 0.5 0.0 -0.2 0.0 0.4 0.0 0.2 -0.1 0.4 0.6 0.5 0.5 0.8 0.8 0.9 0.9 0.7 0.6 0.4 0.5 0.9
0.8 0.8 0.9 0.8 0.8 0.8 0.2 0.6 0.8 0.7 0.9 0.5 0.2 0.3 0.6 0.3 0.4 0.2 0.8 1.4 1.2 0.6 0.5 0.2 0.7 0.5
0.5 0.6 0.5 0.3 0.5 0.7 0.7 0.9 0.4 0.6 1.0 0.9 0.6 0.7 0.6 0.6 0.6 0.4 0.2 -0.1 -0.2 0.2 -0.2 0.2 0.9 0.6 0.7 -0.2 -0.2 0.1 0.3
-0.2 -0.2 -0.2 0.0 0.4 0.6 0.7 0.5 0.5 0.6 0.8 0.4 0.2 0.2 0.4 0.3 0.6 0.3 0.5 0.5 0.5 0.3 0.2 0.5 0.1 0.0 0.0 -0.2 -0.1
0.1 0.3 0.1 0.1 0.3 0.6 0.7 0.4 0.3 0.4 0.3 0.1 0.3 0.5 0.4 0.5 0.8 0.6 0.6 0.7 0.6 0.7 0.5 0.7 0.7 0.4 0.4 0.3 0.4 0.3
0.3 0.3 0.3 0.2 0.4 0.4 0.4 0.3 0.3 0.1 0.1 0.2 0.4 0.4 0.3 0.3 0.4 0.5 0.5 0.4 0.2 0.4 0.6 0.2 0.4 0.3 0.4 0.4 0.4
0.2 0.3 0.3 0.3 0.2 0.2 0.1 0.2 0.2 0.2 -0.2 0.0 0.1 0.0 0.4 0.5 0.6 0.7 0.2 0.2 0.3 0.3 0.3 0.2 0.4 0.4 0.5 0.1 0.2 0.1 0.2
0.6 0.6 0.5 0.5 0.3 0.1 0.0 -0.1 0.2 0.8 0.7 0.5 0.3 0.2 0.2 0.3 0.6 0.7 0.9 0.6 0.5 0.2 0.3 0.3 0.4 0.3 0.2 0.0 0.1 0.0 0.1 0.2
0.2 0.4 0.6 0.6 0.7 0.5 0.6 0.1 0.0 -0.3 0.6 1.0 0.5 0.5 0.3 0.3 0.3 0.4 0.5 0.8 0.9 0.5 0.4 0.2 0.4 0.4 0.3 0.0 0.4 0.2 0.0 0.0 0.1 0.0
0.4 0.4 0.3 0.3 0.7 0.6 0.5 0.6 0.2 0.3 0.5 0.7 0.5 0.3 0.2 0.0 0.5 0.6 0.5 0.7 0.9 0.6 0.6 0.5 0.5 0.5 0.6 0.5 0.3 0.5 0.8 0.4 0.5 0.5
0.5 0.1 0.2 0.2 0.3 0.3 0.3 0.2 0.4 0.3 0.6 0.8 0.4 0.4 0.2 0.2 0.3 0.2 0.2 0.3 0.5 0.4 0.4 0.4 0.4 0.5 0.2 0.4 0.5 0.1 0.4 0.2 0.2 0.3 0.6
0.5 0.5 0.4 0.3 0.4 0.4 0.6 0.4 0.8 0.6 0.5 0.5 0.6 0.7 0.5 0.5 0.3 0.4 0.5 0.5 0.4 0.7 0.8 1.0 1.1 0.8 0.8 0.6 0.9 0.5 0.6 0.8 0.6 0.5 0.6 0.5
-0.2 -0.2 0.0 0.0 0.0 0.4 0.0 0.2 0.2 0.4 0.2 0.3 0.2 0.5 0.3 0.1 -0.3 -0.1 0.0 0.2 0.2 0.0 0.3 0.5 0.5 0.3 0.0 0.3 0.5 0.4 0.0 -0.3 0.0 0.3 0.4
0.3 0.5 0.3 0.2 -0.3 0.4 0.7 0.8 0.8 0.8 0.8 0.5 0.3 0.6 0.7 0.5 0.1 -0.3 -0.7 -0.3 -0.7 -0.8 -0.7 -0.7 -0.5 -0.4 -0.1 0.5 0.4 0.4 0.6 0.5 0.0 -0.3 -0.4 -0.1
1.1 -0.3 0.2

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
JANUARY 1994
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 27



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.9 | 0.5 | | 1.7 | 0.8 | | | | 2.1 | | 0.9 | | | | 1.2 | | | | 0.9 | 0.4 | 1.6 | | | | 0.2 | | | | |
| 1.8 | 1.9 | 2.0 | 1.9 | 2.0 | 1.3 | 2.0 | 1.5 | 0.8 | 1.0 | 0.9 | 1.1 | 1.3 | 1.7 | 1.2 | 2.0 | 1.1 | 1.0 | 1.9 | 2.2 | 2.2 | 1.3 | 1.3 | 2.0 | 1.5 | 1.5 | 2.8 | 2.8 | 3.0 | 2.5 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.8 |
| 1.8 | 1.9 | 2.3 | 2.4 | 2.2 | 2.4 | 2.3 | 2.1 | 1.4 | 1.6 | [illegible] | 1.4 | 1.8 | 1.6 | 0.9 | 1.4 | 0.9 | 1.0 | 1.3 | 2.3 | 2.6 | 2.2 | 2.5 | 2.6 | 2.5 | 2.7 | 3.6 | 4.0 | 3.5 | 2.2 | 0.7 | 0.3 | 0.9 | 1.3 | 1.4 | 1.8 |
| 2.0 | 2.1 | 2.0 | 1.4 | 1.4 | 1.7 | 2.0 | 2.3 | 2.3 | 2.2 | 2.2 | 1.6 | 1.5 | 1.3 | 1.4 | 2.2 | 2.0 | 1.6 | 1.8 | 1.7 | 1.5 | 1.5 | 1.8 | 1.7 | 1.7 | 2.1 | 2.6 | 2.9 | 1.7 | 1.3 | 0.1 | 0.4 | 1.6 | 1.4 | 1.6 | 2.1 |
| 2.1 | 2.4 | 1.8 | 1.4 | 1.7 | 1.7 | 1.4 | 2.1 | 2.7 | [illegible] | 2.3 | 2.5 | 1.9 | 1.9 | 2.4 | 3.1 | 2.8 | 2.2 | 1.9 | 1.8 | 1.5 | 1.6 | 1.6 | 1.9 | 1.8 | 2.4 | 2.6 | 2.4 | 1.9 | 1.7 | 0.6 | 0.8 | [illegible] | 1.5 | 1.4 | 1.9 |
| 1.6 | 1.8 | 2.3 | 2.4 | 2.2 | 2.2 | 1.4 | 1.3 | 2.1 | 1.6 | 1.8 | 1.5 | 1.7 | 1.8 | 1.9 | 2.7 | 3.3 | 2.2 | 1.7 | 1.7 | 1.4 | 1.5 | 1.7 | 2.4 | 2.5 | 2.9 | 2.4 | 2.5 | 2.0 | 0.9 | 0.4 | [illegible] | 0.7 | 0.8 | 1.3 | 1.7 |
| 1.5 | 1.4 | 2.3 | 2.6 | 2.7 | 2.3 | 1.8 | 1.2 | 1.6 | 1.6 | 1.9 | 2.2 | 2.3 | 2.4 | 1.9 | 2.3 | 2.3 | 1.9 | 2.0 | 2.0 | 1.7 | [illegible] | 2.0 | [illegible] | [illegible] | 2.0 | 2.0 | 1.9 | 1.6 | 1.6 | 1.6 | 1.8 | 1.5 | 2.0 | 2.0 | 2.0 |
| 1.7 | 1.6 | 2.1 | 2.3 | 1.8 | 1.9 | 2.2 | 2.4 | 2.7 | 2.6 | 2.1 | 1.8 | 1.5 | 1.6 | 1.4 | 1.8 | 2.4 | 2.5 | 2.2 | 2.4 | 2.1 | 2.0 | 1.6 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.5 | 1.9 | 2.5 | 1.5 | 1.5 | 2.5 | 2.2 | 1.9 |
| 2.1 | 1.6 | 2.1 | 2.3 | 2.3 | 2.2 | 2.2 | 2.6 | 2.8 | 2.5 | 2.7 | 3.1 | 2.1 | 1.5 | 1.8 | 2.1 | 2.4 | 2.8 | 2.8 | 2.7 | 2.5 | 2.6 | 2.7 | 1.7 | 2.4 | 3.0 | 2.7 | 2.5 | 2.8 | 3.4 | 3.9 | 3.6 | 3.3 | 2.7 | 2.3 | 2.2 |
| 1.9 | 1.8 | 1.9 | 2.1 | 2.2 | 2.3 | 2.4 | 2.8 | 2.9 | 2.8 | 2.9 | 2.3 | 2.1 | 2.1 | 2.5 | 2.5 | 2.5 | 2.4 | 2.2 | 2.7 | 2.3 | 2.3 | 2.1 | 1.7 | 2.1 | 2.4 | 2.4 | 2.2 | 2.6 | 3.5 | 3.9 | | 3.2 | 3.2 | 2.5 | 2.2 |
| 1.6 | 1.8 | 1.3 | 1.9 | 2.2 | 2.1 | 2.3 | 2.8 | 2.8 | 2.5 | 2.0 | 1.8 | 2.5 | 2.5 | 2.2 | 2.2 | 2.1 | 1.6 | 2.2 | 1.9 | 1.8 | 2.1 | 1.8 | 1.6 | 1.5 | 2.0 | 2.1 | 2.0 | 1.7 | 1.6 | 2.1 | 2.4 | 1.9 | 1.6 | 2.3 | 2.0 |
| 1.6 | 1.7 | 1.7 | 2.3 | 2.1 | 1.8 | 2.0 | 2.3 | 2.5 | 1.9 | 1.4 | 1.8 | 2.1 | 1.8 | 1.7 | 2.0 | 2.0 | 1.9 | 1.7 | 1.9 | 2.2 | 2.0 | 2.0 | 2.0 | 1.7 | 1.9 | 2.0 | 1.6 | 1.4 | 1.9 | 2.4 | 2.1 | 2.2 | 1.6 | 1.6 | 1.5 |
| 1.4 | 1.6 | 2.1 | 2.3 | 1.8 | 1.9 | 2.0 | 2.1 | 2.4 | 2.2 | 1.8 | 1.4 | 1.6 | 1.9 | 1.9 | 2.0 | 2.2 | 2.0 | 2.1 | 1.9 | 1.7 | 1.7 | 1.7 | 1.9 | 2.0 | 2.0 | 2.3 | 2.2 | 1.8 | 1.6 | 1.7 | 1.3 | 1.4 | 1.4 | 1.3 | 1.1 |
| 1.5 | 1.9 | 2.0 | 2.2 | 2.1 | 2.1 | 1.7 | 2.0 | 2.0 | 2.3 | 1.9 | 1.6 | 1.8 | 2.0 | 2.0 | 2.3 | 2.2 | 2.0 | 1.7 | 1.5 | 1.7 | 1.9 | 1.8 | 1.8 | 2.1 | 2.1 | 2.1 | 2.3 | 2.1 | 2.1 | 2.0 | 1.9 | 2.0 | 1.8 | 1.2 | 1.4 |
| 1.7 | 1.9 | 1.9 | 2.2 | 2.0 | 2.1 | 1.6 | 1.5 | 1.4 | 1.5 | 1.8 | 1.8 | 1.5 | 1.7 | 2.1 | 1.9 | 1.7 | 1.7 | 1.5 | 1.6 | 1.8 | 1.7 | 1.8 | 1.6 | 1.8 | 1.7 | 1.6 | 1.6 | 1.7 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.7 |
| 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 2.0 | 2.1 | 1.9 | 2.0 | 2.1 | 1.9 | 1.6 | 1.9 | 1.6 | 1.7 | 1.7 | 1.4 | 1.6 | 1.7 | 1.6 | 1.5 | 1.6 | 1.8 | 1.9 | 1.8 | 1.6 | 1.7 | 1.6 | 1.7 | 1.7 | 1.6 | 1.8 | 1.9 | 2.1 | 1.8 | 1.9 |
| 2.0 | 1.9 | 2.0 | 1.9 | 1.6 | 1.7 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.6 | 1.8 | 1.7 | 1.8 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 | 1.7 | 1.7 | 1.9 | 1.8 | 2.0 | 1.6 | 1.7 | 1.7 | 1.8 | 1.8 | 1.8 | 2.0 | 2.0 | 2.0 | 1.9 | 1.7 | 2.0 |
| | | | | | | | | | | 1.5 | | | | | | | | 1.8 | 1.9 | | | | | | | | | | | | | | | | |

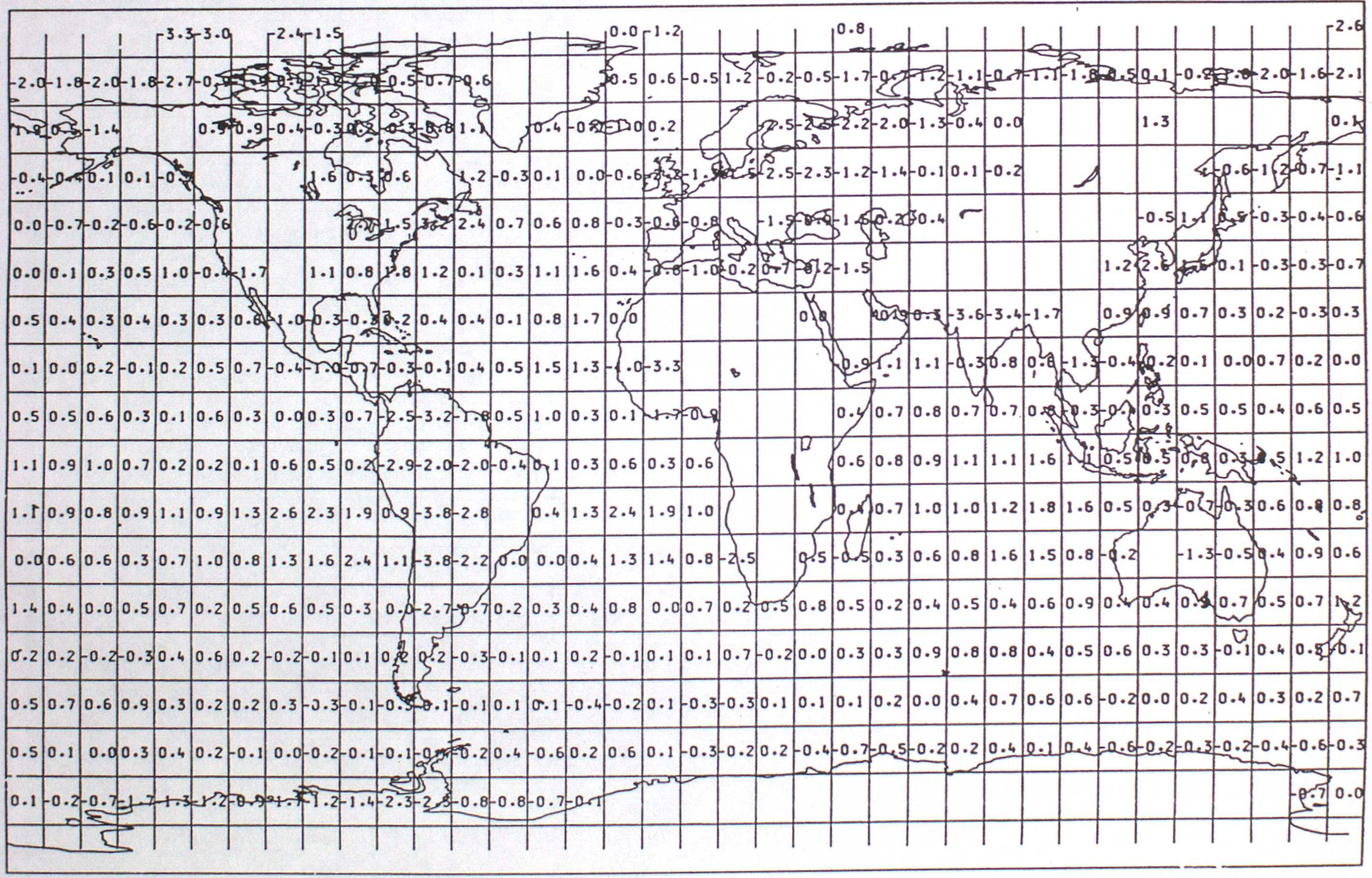
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA

FIGURE 28

JANUARY 1994

NOAA-12. USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



-3.3 -3.0 -2.4 -1.5 0.0 -1.2 0.8 -2.6
-2.0 -1.8 -2.0 -1.8 -2.7 -0.5 -0.7 -0.6 -0.5 0.6 -0.5 1.2 -0.2 -0.5 -1.7 -1.1 0.1 -2.0 -1.6 -2.1
-1.4 0.9 -0.4 -0.3 1.1 -0.4 0.2 -2.2 -2.0 -1.3 -0.4 0.0 1.3 0.1
-0.4 0.1 0.1 1.6 0.6 1.2 -0.3 0.1 0.0 -0.6 -2.5 -2.3 -1.2 -1.4 -0.1 0.1 -0.2 -0.6 -0.7 -1.1
0.0 -0.7 -0.2 -0.6 -0.2 -0.6 2.4 0.7 0.6 0.8 -0.3 -1.5 -0.4 -0.5 -0.3 -0.4 -0.6
0.0 0.1 0.3 0.5 1.0 -0.4 -1.7 1.1 0.8 1.2 0.1 0.3 1.1 1.6 0.4 -1.0 -1.5 1.2 0.1 -0.3 -0.3 -0.7
0.5 0.4 0.3 0.4 0.3 0.3 -1.0 0.2 0.4 0.4 0.1 0.8 1.7 -3.6 -3.4 -1.7 0.9 0.7 0.3 0.2 -0.3 0.3
0.1 0.0 0.2 -0.1 0.2 0.5 0.7 -0.4 -0.3 -0.1 0.4 0.5 1.5 1.3 -3.3 1.1 -0.3 0.8 0.2 0.1 0.0 0.7 0.2 0.0
0.5 0.5 0.6 0.3 0.1 0.6 0.3 0.0 0.3 0.7 -2.5 -3.2 0.5 1.0 0.3 0.1 0.7 0.8 0.7 0.7 0.3 0.5 0.5 0.4 0.6 0.5
1.1 0.9 1.0 0.7 0.2 0.2 0.1 0.6 0.5 0.2 -2.9 -2.0 -2.0 -0.4 0.1 0.3 0.6 0.3 0.6 0.6 0.8 0.9 1.1 1.1 1.6 0.5 1.2 1.0
1.1 0.9 0.8 0.9 1.1 0.9 1.3 2.6 2.3 1.9 -3.8 -2.8 0.4 1.3 2.4 1.9 1.0 0.7 1.0 1.0 1.2 1.8 1.6 0.5 0.6 0.8
0.0 0.6 0.6 0.3 0.7 1.0 0.8 1.3 1.6 2.4 1.1 -3.8 -2.2 0.0 0.0 0.4 1.3 1.4 0.8 -2.5 0.3 0.6 0.8 1.6 1.5 0.8 -1.3 0.9 0.6
1.4 0.4 0.0 0.5 0.7 0.2 0.5 0.6 0.5 0.3 -2.7 0.2 0.3 0.4 0.8 0.0 0.7 0.2 0.5 0.8 0.5 0.2 0.4 0.5 0.4 0.6 0.9 0.4 0.7 0.5 0.7
0.2 0.2 -0.2 -0.3 0.4 0.6 0.2 -0.2 -0.1 0.1 -0.3 -0.1 0.1 0.2 -0.1 0.1 0.1 0.7 -0.2 0.0 0.3 0.3 0.9 0.8 0.8 0.4 0.5 0.6 0.3 0.3 -0.1 0.4 -0.1
0.5 0.7 0.6 0.9 0.3 0.2 0.2 0.3 -0.3 -0.1 -0.1 0.1 -0.4 -0.2 0.1 -0.3 -0.3 0.1 0.1 0.1 0.2 0.0 0.4 0.7 0.6 0.6 -0.2 0.0 0.2 0.4 0.3 0.2 0.7
0.5 0.1 0.0 0.3 0.4 0.2 -0.1 0.0 -0.2 -0.1 -0.1 -0.2 0.4 -0.6 0.2 0.6 0.1 -0.3 -0.2 0.2 -0.4 -0.7 -0.5 -0.2 0.2 0.4 0.1 0.4 -0.6 -0.2 -0.3 -0.2 -0.4 -0.6 -0.3
0.1 -0.2 -0.7 -1.7 -1.3 -1.2 -0.9 -1.7 1.2 -1.4 -2.3 -2.5 -0.8 -0.8 -0.7 -0.1 -0.7 0.0

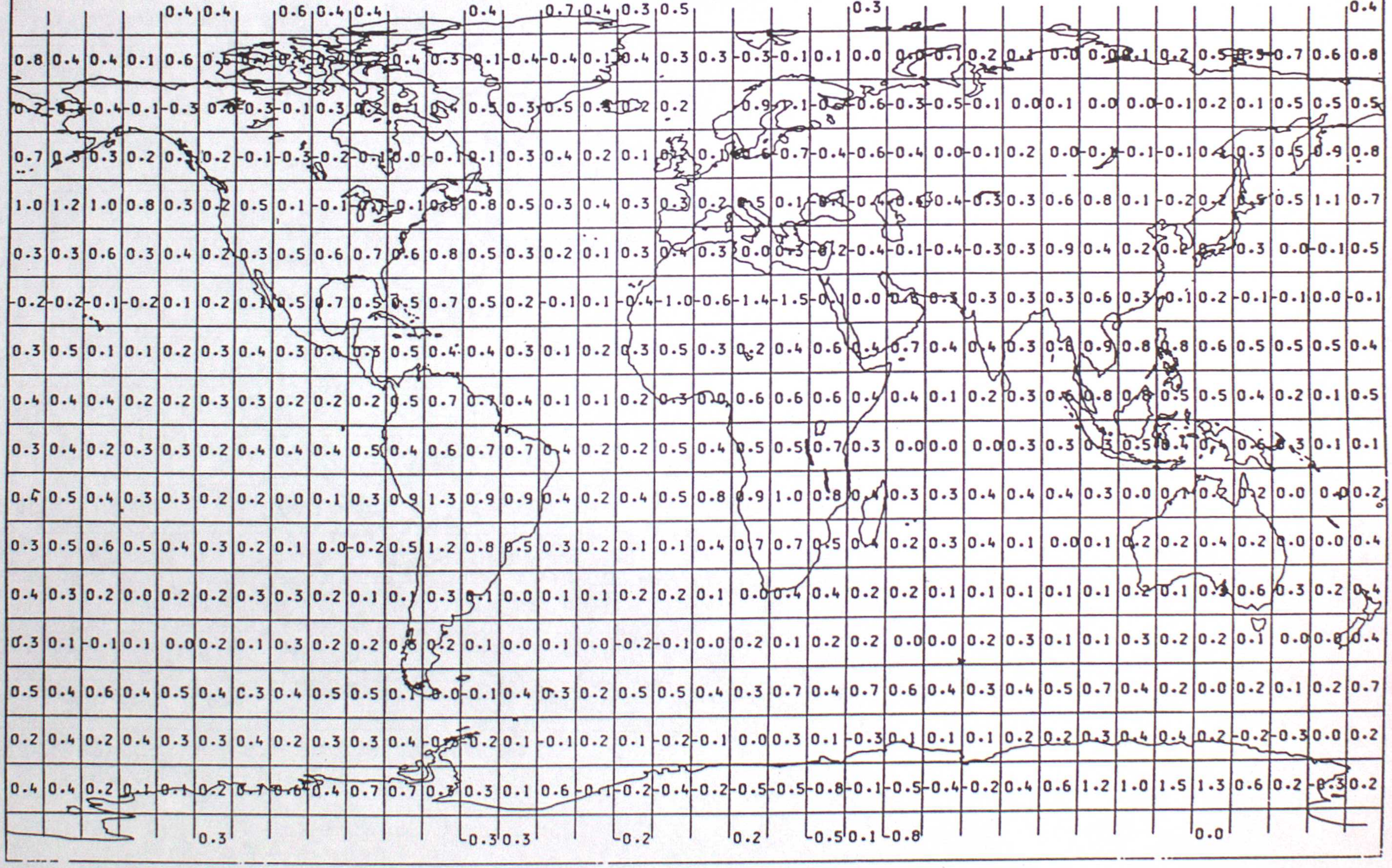
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA

JANUARY 1994

NOAA-12. USING ALL OBSERVATIONS

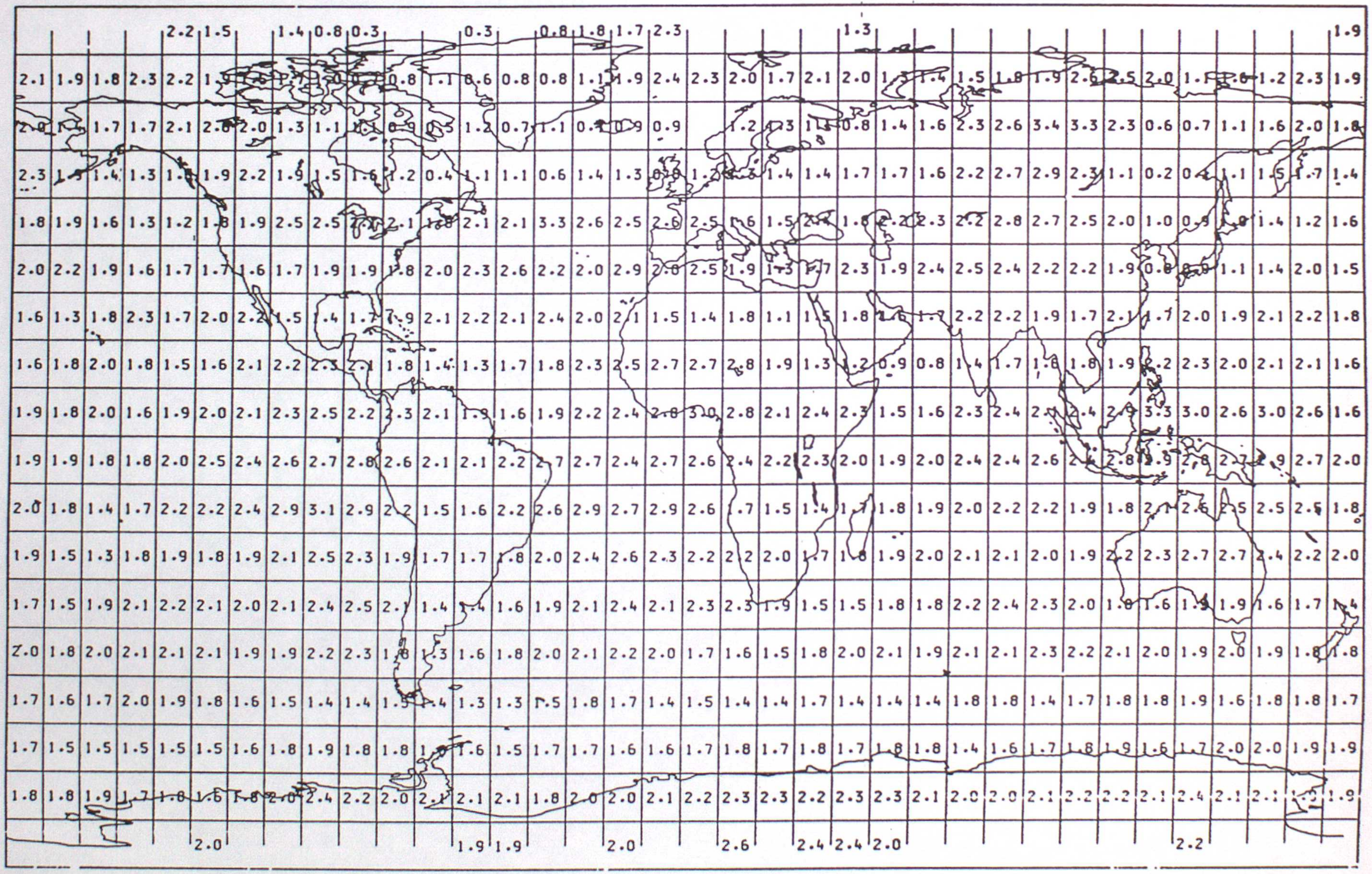
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 29


0.4 0.4 0.6 0.4 0.4 0.4 0.7 0.4 0.3 0.5 0.3 0.4
0.8 0.4 0.4 0.1 0.6 0.4 0.3 -0.1 -0.4 -0.4 0.1 0.4 0.3 0.3 -0.3 -0.1 0.1 0.0 0.2 0.0 0.2 0.5 -0.7 0.6 0.8
-0.4 -0.1 -0.3 -0.3 -0.1 0.3 0.5 0.3 0.5 0.2 0.2 -0.6 -0.3 -0.5 -0.1 0.0 0.1 0.0 0.0 -0.1 0.2 0.1 0.5 0.5 0.5
0.7 0.3 0.2 0.2 -0.1 -0.2 0.0 0.1 0.3 0.4 0.2 0.1 0.1 -0.7 -0.4 -0.6 -0.4 0.0 -0.1 0.2 0.0 -0.1 -0.1 0.3 0.9 0.8
1.0 1.2 1.0 0.8 0.3 0.2 0.5 0.1 -0.1 0.8 0.5 0.3 0.4 0.3 0.3 0.2 0.1 -0.4 -0.3 0.3 0.6 0.8 0.1 -0.2 0.5 1.1 0.7
0.3 0.3 0.6 0.3 0.4 0.2 0.3 0.5 0.6 0.7 0.6 0.8 0.5 0.3 0.2 0.1 0.3 0.4 0.3 0.0 -0.4 -0.1 -0.4 -0.3 0.3 0.9 0.4 0.2 -0.3 0.0 -0.1 0.5
-0.2 -0.2 -0.1 -0.2 0.1 0.2 0.1 0.5 0.7 0.5 0.5 0.7 0.5 0.2 -0.1 0.1 -0.4 -1.0 -0.6 -1.4 -1.5 0.0 0.3 0.3 0.3 0.6 0.3 -0.1 0.2 -0.1 -0.1 0.0 -0.1
0.3 0.5 0.1 0.1 0.2 0.3 0.4 0.3 0.5 0.4 0.4 0.3 0.1 0.2 0.3 0.5 0.3 0.2 0.4 0.6 0.4 0.7 0.4 0.4 0.3 0.9 0.8 0.8 0.6 0.5 0.5 0.5 0.4
0.4 0.4 0.4 0.2 0.2 0.3 0.3 0.2 0.2 0.2 0.5 0.7 0.7 0.4 0.1 0.1 0.2 0.3 0.0 0.6 0.6 0.6 0.4 0.4 0.1 0.2 0.3 0.8 0.5 0.5 0.4 0.2 0.1 0.5
0.3 0.4 0.2 0.3 0.3 0.2 0.4 0.4 0.4 0.5 0.4 0.6 0.7 0.7 0.4 0.2 0.2 0.5 0.4 0.5 0.5 0.7 0.3 0.0 0.0 0.0 0.3 0.3 0.3 0.5 0.4 0.3 0.1 0.1
0.4 0.5 0.4 0.3 0.3 0.2 0.2 0.0 0.1 0.3 0.9 1.3 0.9 0.9 0.4 0.2 0.4 0.5 0.8 0.9 1.0 0.8 0.4 0.3 0.3 0.4 0.4 0.4 0.3 0.0 0.2 0.0 0.2
0.3 0.5 0.6 0.5 0.4 0.3 0.2 0.1 0.0 -0.2 0.5 1.2 0.8 0.5 0.3 0.2 0.1 0.1 0.4 0.7 0.7 0.5 0.4 0.2 0.3 0.4 0.1 0.0 0.1 0.2 0.2 0.4 0.2 0.0 0.0 0.4
0.4 0.3 0.2 0.0 0.2 0.2 0.3 0.3 0.2 0.1 0.1 0.3 0.1 0.0 0.1 0.1 0.2 0.2 0.1 0.0 0.4 0.4 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.2 0.1 0.3 0.6 0.3 0.2 0.4
0.3 0.1 -0.1 0.1 0.0 0.2 0.1 0.3 0.2 0.2 0.8 0.2 0.1 0.0 0.1 0.0 -0.2 -0.1 0.0 0.2 0.1 0.2 0.2 0.0 0.0 0.2 0.3 0.1 0.1 0.3 0.2 0.2 0.1 0.0 0.4
0.5 0.4 0.6 0.4 0.5 0.4 0.3 0.4 0.5 0.5 0.1 0.0 -0.1 0.4 0.3 0.2 0.5 0.5 0.4 0.3 0.7 0.4 0.7 0.6 0.4 0.3 0.4 0.5 0.7 0.4 0.2 0.0 0.2 0.1 0.2 0.7
0.2 0.4 0.2 0.4 0.3 0.3 0.4 0.2 0.3 0.3 0.4 -0.2 0.1 -0.1 0.2 0.1 -0.2 -0.1 0.0 0.3 0.1 -0.3 0.1 0.1 0.1 0.2 0.2 0.3 0.4 0.4 0.2 -0.2 -0.3 0.0 0.2
0.4 0.4 0.2 0.4 0.7 0.7 0.3 0.1 0.6 -0.2 -0.4 -0.2 -0.5 -0.5 -0.8 -0.1 -0.5 -0.4 -0.2 0.4 0.6 1.2 1.0 1.5 1.3 0.6 0.2 0.2
0.3 -0.3 0.3 -0.2 0.2 -0.5 0.1 -0.8 0.0

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
JANUARY 1994
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 30


2.2 1.5 1.4 0.8 0.3 0.3 0.8 1.8 1.7 2.3 1.3 1.9
2.1 1.9 1.8 2.3 2.2 1.9 0.8 1.1 0.6 0.8 0.8 1.1 1.9 2.4 2.3 2.0 1.7 2.1 2.0 1.3 1.4 1.5 1.8 1.9 2.6 2.5 2.0 1.1 1.6 1.2 2.3 1.9
2.0 1.5 1.7 1.7 2.1 2.6 2.0 1.3 1.1 1.1 0.9 0.5 1.2 0.7 1.1 0.1 0.9 0.9 1.2 1.3 1.5 0.8 1.4 1.6 2.3 2.6 3.4 3.3 2.3 0.6 0.7 1.1 1.6 2.0 1.8
2.3 1.3 1.4 1.3 1.6 1.9 2.2 1.9 1.5 1.6 1.2 0.4 1.1 1.1 0.6 1.4 1.3 0.8 1.2 1.3 1.4 1.4 1.7 1.7 1.6 2.2 2.7 2.9 2.3 1.1 0.2 0.4 1.1 1.5 1.7 1.4
1.8 1.9 1.6 1.3 1.2 1.8 1.9 2.5 2.5 2.2 2.1 1.8 2.1 2.1 3.3 2.6 2.5 2.6 2.5 1.6 1.5 2.4 1.6 2.2 2.3 2.2 2.8 2.7 2.5 2.0 1.0 0.9 1.8 1.4 1.2 1.6
2.0 2.2 1.9 1.6 1.7 1.7 1.6 1.7 1.9 1.9 1.8 2.0 2.3 2.6 2.2 2.0 2.9 2.0 2.5 1.9 1.3 1.7 2.3 1.9 2.4 2.5 2.4 2.2 2.2 1.9 0.8 0.9 1.1 1.4 2.0 1.5
1.6 1.3 1.8 2.3 1.7 2.0 2.2 1.5 1.4 1.7 1.9 2.1 2.2 2.1 2.4 2.0 2.1 1.5 1.4 1.8 1.1 1.5 1.8 1.6 1.7 2.2 2.2 1.9 1.7 2.1 1.7 2.0 1.9 2.1 2.2 1.8
1.6 1.8 2.0 1.8 1.5 1.6 2.1 2.2 2.3 2.1 1.8 1.4 1.3 1.7 1.8 2.3 2.5 2.7 2.7 2.8 1.9 1.3 1.2 0.9 0.8 1.4 1.7 1.8 1.8 1.9 2.2 2.3 2.0 2.1 2.1 1.6
1.9 1.8 2.0 1.6 1.9 2.0 2.1 2.3 2.5 2.2 2.3 2.1 1.9 1.6 1.9 2.2 2.4 2.8 3.0 2.8 2.1 2.4 2.3 1.5 1.6 2.3 2.4 2.4 2.4 2.9 3.3 3.0 2.6 3.0 2.6 1.6
1.9 1.9 1.8 1.8 2.0 2.5 2.4 2.6 2.7 2.8 2.6 2.1 2.1 2.2 2.7 2.7 2.4 2.7 2.6 2.4 2.2 2.3 2.0 1.9 2.0 2.4 2.4 2.6 2.4 2.8 2.9 2.8 2.7 2.9 2.7 2.0
2.0 1.8 1.4 1.7 2.2 2.2 2.4 2.9 3.1 2.9 2.2 1.5 1.6 2.2 2.6 2.9 2.7 2.9 2.6 1.7 1.5 1.4 1.7 1.8 1.9 2.0 2.2 2.2 1.9 1.8 2.1 2.6 2.5 2.5 2.5 1.8
1.9 1.5 1.3 1.8 1.9 1.8 1.9 2.1 2.5 2.3 1.9 1.7 1.7 1.8 2.0 2.4 2.6 2.3 2.2 2.2 2.0 1.7 1.8 1.9 2.0 2.1 2.1 2.0 1.9 2.2 2.3 2.7 2.7 2.4 2.2 2.0
1.7 1.5 1.9 2.1 2.2 2.1 2.0 2.1 2.4 2.5 2.1 1.4 1.4 1.6 1.9 2.1 2.4 2.1 2.3 2.3 1.9 1.5 1.5 1.8 1.8 2.2 2.4 2.3 2.0 1.8 1.6 1.5 1.9 1.6 1.7 1.4
2.0 1.8 2.0 2.1 2.1 2.1 1.9 1.9 2.2 2.3 1.8 1.3 1.6 1.8 2.0 2.1 2.2 2.0 1.7 1.6 1.5 1.8 2.0 2.1 1.9 2.1 2.1 2.3 2.2 2.1 2.0 1.9 2.0 1.9 1.8 1.8
1.7 1.6 1.7 2.0 1.9 1.8 1.6 1.5 1.4 1.4 1.5 1.4 1.3 1.3 1.5 1.8 1.7 1.4 1.5 1.4 1.4 1.7 1.4 1.4 1.4 1.8 1.8 1.4 1.7 1.8 1.8 1.9 1.6 1.8 1.8 1.7
1.7 1.5 1.5 1.5 1.5 1.5 1.6 1.8 1.9 1.8 1.8 1.6 1.6 1.5 1.7 1.7 1.6 1.6 1.7 1.8 1.7 1.8 1.7 1.8 1.8 1.4 1.6 1.7 1.8 1.9 1.6 1.7 2.0 2.0 1.9 1.9
1.8 1.8 1.9 1.7 1.8 1.6 1.8 2.0 2.4 2.2 2.0 2.1 2.1 2.1 1.8 2.0 2.0 2.1 2.2 2.3 2.3 2.2 2.3 2.3 2.1 2.0 2.0 2.1 2.2 2.2 2.1 2.4 2.1 2.1 1.9 1.9
2.0 1.9 1.9 2.0 2.6 2.4 2.4 2.0 2.2

## TABLE 7

### MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
### DATA TYPE:- DRIFTER
### MONITORING CENTRE: BRACKNELL
### MONTH:January ,94

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | :One calendar month. | |
| **Data monitored** | :Reports from each unique identifier for drifting buoy. | |
| **Area monitored** | :10°N - 80°N, 85°W - 0°W | |
| **Standard of comparison** | :Background field from Bracknell global model. | |
| **Position** | :Average latitude and longitude for period. | |
| **Observation times** | :All hours combined. | |
| **Elements monitored** | :Mean sea-level pressure (hPa)<br>Wind speed (m $s^{-1}$)<br>Wind direction (degrees) | |
| **Parameters monitored** | :NOBS | :Number of observations received excluding duplicates. |
| | :NGE | :Number of observations with gross errors. |
| | :PGE | :Percentage of observations with gross errors. |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors.<br>**N.B. a positive bias indicates the observation is veered to the background.** |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors |
| **GROSS ERROR LIMITS** | :15 hPa (pressure)<br>:25 m $s^{-1}$ (Vector Wind) | |

**N.B.** Observations of wind direction are only included in the wind direction statistics if the wind speed > 3 m $s^{-1}$ .

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | | | |
| 12509 | 44.7 | -63.6 | ALL | MSLP | SUR | 9 | 0 | 0 | 1.4 | -5.2 | 5.4 |
| 13556 | 29.2 | -24.1 | ALL | MSLP | SUR | 169 | 0 | 0 | 0.9 | 0.0 | 0.9 |
| 13561 | 34.5 | -16.8 | ALL | MSLP | SUR | 167 | 0 | 0 | 1.3 | 0.5 | 1.3 |
| 25561 | 65.6 | -27.2 | ALL | MSLP | SUR | 600 | 12 | 2 | 2.7 | 0.8 | 2.8 |
| 40503 | 29.9 | -58.8 | ALL | MSLP | SUR | 3 | 0 | 0 | 0.9 | -0.7 | 1.1 |
| 40703 | 29.0 | -62.5 | ALL | MSLP | SUR | 1 | 0 | 0 | 0.0 | 0.1 | 0.1 |
| 40705 | 29.7 | -65.3 | ALL | MSLP | SUR | 4 | 0 | 0 | 1.6 | -0.8 | 1.8 |
| 40802 | 24.6 | -41.0 | ALL | MSLP | SUR | 1 | 0 | 0 | 0.0 | -1.0 | 1.0 |
| 40806 | 32.8 | -51.9 | ALL | MSLP | SUR | 4 | 0 | 0 | 1.3 | -0.7 | 1.5 |
| 40809 | 46.8 | -8.5 | ALL | MSLP | SUR | 1 | 0 | 0 | 0.0 | 0.6 | 0.6 |
| 41522 | 27.7 | -70.1 | ALL | MSLP | SUR | 281 | 0 | 0 | 1.0 | -0.1 | 1.1 |
| 41523 | 21.6 | -76.2 | ALL | MSLP | SUR | 249 | 0 | 0 | 1.0 | 0.0 | 1.0 |
| 44515 | 53.3 | -17.4 | ALL | MSLP | SUR | 343 | 0 | 0 | 1.9 | -0.4 | 1.9 |
| 44613 | 48.9 | -11.1 | ALL | MSLP | SUR | 982 | 1 | 0 | 2.0 | -0.1 | 2.0 |
| 44624 | 55.4 | -37.7 | ALL | MSLP | SUR | 4 | 4 | 100 | 0.0 | 0.0 | 0.0 |
| 44726 | 53.2 | -41.4 | ALL | MSLP | SUR | 1 | 1 | 100 | 0.0 | 0.0 | 0.0 |
| 44728 | 56.4 | -23.9 | ALL | MSLP | SUR | 1607 | 46 | 3 | 4.9 | 0.0 | 4.9 |
| 44765 | 26.5 | -50.1 | ALL | MSLP | SUR | 285 | 0 | 0 | 1.0 | -0.2 | 1.0 |
| 44774 | 40.5 | -28.4 | ALL | MSLP | SUR | 173 | 0 | 0 | 1.2 | -0.3 | 1.2 |
| 44775 | 42.5 | -8.8 | ALL | MSLP | SUR | 362 | 30 | 8 | 5.7 | -2.9 | 6.4 |
| 44777 | 49.7 | -7.9 | ALL | MSLP | SUR | 997 | 1 | 0 | 1.7 | -0.4 | 1.7 |
| 44778 | 59.2 | -18.6 | ALL | MSLP | SUR | 1521 | 3 | 0 | 2.5 | 0.2 | 2.5 |
| 44779 | 54.0 | -19.4 | ALL | MSLP | SUR | 1094 | 2 | 0 | 2.5 | -0.2 | 2.5 |
| 47606 | 59.7 | -58.0 | ALL | MSLP | SUR | 14 | 14 | 100 | 0.0 | 0.0 | 0.0 |
| 50605 | 33.0 | -40.9 | ALL | MSLP | SUR | 1 | 0 | 0 | 0.0 | -0.4 | 0.4 |
| 54531 | 44.7 | -63.6 | ALL | MSLP | SUR | 9 | 0 | 0 | 1.1 | -4.5 | 4.6 |
| 62501 | 45.0 | -11.9 | ALL | MSLP | SUR | 294 | 0 | 0 | 1.4 | 0.8 | 1.6 |
| 62502 | 46.8 | -9.0 | ALL | MSLP | SUR | 189 | 0 | 0 | 1.5 | 0.4 | 1.6 |
| 62514 | 43.9 | -28.3 | ALL | MSLP | SUR | 263 | 1 | 0 | 2.4 | 2.2 | 3.2 |
| 62519 | 43.6 | -7.3 | ALL | MSLP | SUR | 145 | 0 | 0 | 1.9 | -0.9 | 2.1 |
| 62520 | 49.7 | -7.8 | ALL | MSLP | SUR | 316 | 13 | 4 | 1.9 | 0.5 | 2.0 |
| 62524 | 38.6 | -23.8 | ALL | MSLP | SUR | 1065 | 1 | 0 | 1.2 | 0.1 | 1.2 |
| 62601 | 19.1 | -49.7 | ALL | MSLP | SUR | 260 | 0 | 0 | 0.9 | 0.1 | 0.9 |
| 62695 | 40.4 | -28.4 | ALL | MSLP | SUR | 830 | 2 | 0 | 1.3 | -0.4 | 1.3 |
| 62711 | 58.3 | -21.8 | ALL | MSLP | SUR | 1358 | 2 | 0 | 2.8 | 0.1 | 2.8 |
| 62712 | 58.6 | -33.9 | ALL | MSLP | SUR | 245 | 1 | 0 | 2.2 | 1.4 | 2.6 |
| 64587 | 58.8 | -39.5 | ALL | MSLP | SUR | 58 | 0 | 0 | 2.8 | -0.3 | 2.8 |
| 65503 | 59.6 | -28.3 | ALL | MSLP | SUR | 232 | 2 | 1 | 2.4 | 2.4 | 3.3 |
| 65506 | 59.0 | -29.5 | ALL | MSLP | SUR | 274 | 0 | 0 | 2.2 | -0.4 | 2.2 |
| 65508 | 58.4 | -38.5 | ALL | MSLP | SUR | 258 | 1 | 0 | 2.9 | 1.0 | 3.1 |
| 65581 | 59.7 | -44.3 | ALL | MSLP | SUR | 1205 | 170 | 14 | 5.0 | 0.3 | 5.0 |
| 65592 | 58.5 | -34.5 | ALL | MSLP | SUR | 1291 | 23 | 2 | 3.8 | -0.3 | 3.8 |
| WIND SPEED | | | | | | | | | | | |
| 13556 | 29.2 | -24.1 | ALL | SPEED | SUR | 491 | 0 | 0 | 1.7 | -1.9 | 2.6 |
| 13561 | 34.5 | -16.8 | ALL | SPEED | SUR | 490 | 0 | 0 | 1.9 | -1.3 | 2.3 |
| 40503 | 29.9 | -58.8 | ALL | SPEED | SUR | 3 | 0 | 0 | 2.6 | 0.0 | 2.6 |
| 40703 | 29.0 | -62.5 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -0.7 | 0.7 |
| 40705 | 29.7 | -65.3 | ALL | SPEED | SUR | 4 | 0 | 0 | 2.8 | 3.1 | 4.2 |
| 40802 | 24.6 | -41.0 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -3.6 | 3.6 |
| 40806 | 32.8 | -51.9 | ALL | SPEED | SUR | 4 | 0 | 0 | 1.3 | 0.9 | 1.6 |
| 40809 | 46.8 | -8.5 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | 4.4 | 4.4 |
| 44728 | 56.4 | -23.9 | ALL | SPEED | SUR | 1074 | 3 | 0 | 3.3 | -3.3 | 4.6 |
| 50605 | 33.0 | -40.9 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -2.0 | 2.0 |
| 62502 | 46.8 | -9.0 | ALL | SPEED | SUR | 554 | 0 | 0 | 1.9 | -0.5 | 2.0 |
| 62695 | 40.4 | -28.4 | ALL | SPEED | SUR | 731 | 1 | 0 | 2.1 | -3.1 | 3.7 |
| 62712 | 58.6 | -33.9 | ALL | SPEED | SUR | 131 | 1 | 1 | 3.8 | -3.7 | 5.3 |
| WIND DIRECTION | | | | | | | | | | | |
| 13556 | 29.2 | -24.1 | ALL | DIRN. | SUR | 371 | 0 | 0 | 17.1 | 4.2 | 17.6 |
| 13561 | 34.5 | -16.8 | ALL | DIRN. | SUR | 407 | 0 | 0 | 16.7 | -9.1 | 19.0 |
| 40503 | 29.9 | -58.8 | ALL | DIRN. | SUR | 2 | 0 | 0 | 12.8 | 7.2 | 14.7 |

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WIND DIRECTION | | | | | | | | | | | |
| 40703 | 29.0 | -62.5 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -11.2 | 11.2 |
| 40705 | 29.7 | -65.3 | ALL | DIRN. | SUR | 4 | 0 | 0 | 16.4 | 7.1 | 17.9 |
| 40802 | 24.6 | -41.0 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -1.5 | 1.5 |
| 40806 | 32.8 | -51.9 | ALL | DIRN. | SUR | 4 | 0 | 0 | 30.8 | -20.8 | 37.2 |
| 40809 | 46.8 | -8.5 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | 12.0 | 12.0 |
| 44728 | 56.4 | -23.9 | ALL | DIRN. | SUR | 995 | 3 | 0 | 36.9 | 4.9 | 37.2 |
| 50605 | 33.0 | -40.9 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | 4.7 | 4.7 |
| 62502 | 46.8 | -9.0 | ALL | DIRN. | SUR | 490 | 0 | 0 | 17.5 | -10.8 | 20.6 |
| 62695 | 40.4 | -28.4 | ALL | DIRN. | SUR | 612 | 1 | 0 | 43.4 | -9.5 | 44.4 |
| 62712 | 58.6 | -33.9 | ALL | DIRN. | SUR | 121 | 1 | 1 | 36.6 | 26.4 | 45.2 |

## TABLE 8

### MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
### MONITORING CENTRE: BRACKNELL
### MONTH:January, 94

**Monitoring procedures:**

**Period** :One calendar month.

**Data monitored** :Statistics for each airline carrier.

**Area monitored** :40°N - 70°N, 60°W - 0°W.

**Standard of comparison** :Background field from Bracknell global model.

**Observation times** :All hours combined.

**Level(s) monitored** :300.0 - 150.0 hPa

**Elements monitored** :TEMP in $^{o}$C ; WIND in m s$^{-1}$

**Parameters monitored** :N REP.:Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

**GROSS ERROR LIMITS** :10.0 $^{o}$C ; 60 m s$^{-1}$ Vector Wind

**SELECTION CRITERIA** :N REP $\geq$ 20

|  | TEMPERATURE |  |  |  |  | WIND |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAL | 684 | 0 | 3 | 1.9 | -0.3 | 693 | 0 | 2 | 0 | 9.4 | 1.7 |
| ACA | 466 | 2 | 3 | 2.5 | -0.5 | 481 | 0 | 3 | 1 | 10.2 | 1.8 |
| AEA | 77 | 1 | 4 | 1.5 | -0.3 | 77 | 1 | 5 | 0 | 13.8 | 0.0 |
| AEL | 217 | 1 | 3 | 2.0 | -0.3 | 224 | 0 | 3 | 0 | 9.9 | 1.3 |
| AFL | 139 | 3 | 100 | 4.0 | 2.3 | 143 | 1 | 100 | 0 | 17.7 | 1.1 |
| AFR | 489 | 1 | 8 | 1.9 | 0.1 | 501 | 0 | 8 | 0 | 9.9 | 1.2 |
| AMX | 170 | 1 | 1 | 2.0 | -0.3 | 170 | 1 | 3 | 0 | 9.9 | 1.4 |
| ANZ | 128 | 1 | 4 | 2.1 | -1.0 | 127 | 0 | 4 | 1 | 6.5 | 0.9 |
| AOM | 200 | 3 | 8 | 2.3 | 0.1 | 206 | 0 | 3 | 0 | 11.4 | 1.6 |
| AUA | 47 | 0 | 100 | 1.9 | -0.5 | 48 | 0 | 0 | 0 | 7.2 | 1.3 |
| AVA | 131 | 2 | 4 | 2.2 | 0.1 | 134 | 0 | 3 | 0 | 11.5 | 0.2 |
| AVY | 22 | 0 | 9 | 2.7 | -0.3 | 22 | 0 | 9 | 0 | 9.7 | 1.5 |
| AZA | 309 | 1 | 4 | 2.2 | 0.6 | 309 | 0 | 5 | 0 | 10.6 | 1.9 |
| BAL | 29 | 0 | 17 | 1.8 | -0.1 | 30 | 0 | 20 | 0 | 10.9 | 3.7 |
| BAW | 562 | 1 | 10 | 1.9 | 0.0 | 571 | 0 | 10 | 1 | 9.0 | 2.1 |
| BWA | 143 | 1 | 1 | 1.9 | 0.9 | 143 | 0 | 2 | 0 | 11.5 | 0.8 |
| CDN | 329 | 0 | 8 | 1.9 | 0.5 | 328 | 0 | 9 | 2 | 8.0 | 1.2 |
| CFG | 379 | 1 | 3 | 2.2 | -0.9 | 380 | 0 | 3 | 0 | 10.1 | 0.9 |
| CLX | 33 | 0 | 0 | 1.9 | -0.2 | 34 | 0 | 0 | 0 | 8.8 | 2.5 |
| COA | 141 | 1 | 1 | 2.1 | 0.6 | 142 | 1 | 4 | 1 | 8.0 | 0.9 |
| CRL | 94 | 1 | 1 | 2.0 | 0.2 | 95 | 0 | 2 | 0 | 9.7 | 0.8 |
| CTM | 40 | 0 | 23 | 2.4 | -1.5 | 40 | 0 | 20 | 0 | 8.7 | 2.6 |
| CUB | 54 | 2 | 100 | 2.9 | 0.0 | 54 | 0 | 13 | 0 | 14.3 | -0.7 |
| DAE | 20 | 0 | 0 | 1.6 | -1.1 | 20 | 0 | 0 | 0 | 9.9 | 2.3 |
| DAL | 1240 | 0 | 2 | 2.1 | 0.0 | 1252 | 0 | 3 | 0 | 10.3 | 1.3 |
| DHL | 140 | 1 | 9 | 2.9 | -0.1 | 142 | 0 | 17 | 0 | 17.3 | 3.8 |
| DLH | 1276 | 0 | 7 | 2.0 | -0.1 | 1277 | 0 | 8 | 2 | 8.9 | 1.4 |
| DOA | 54 | 0 | 6 | 1.4 | -0.3 | 57 | 0 | 12 | 0 | 10.8 | 0.1 |
| EIA | 198 | 3 | 10 | 2.1 | -0.1 | 207 | 0 | 12 | 0 | 12.8 | 3.9 |
| EIN | 24 | 4 | 4 | 2.5 | 1.5 | 24 | 4 | 4 | 0 | 11.1 | 3.0 |
| ELY | 119 | 1 | 9 | 1.7 | 0.1 | 119 | 1 | 8 | 0 | 8.4 | 0.1 |
| EWW | 29 | 7 | 10 | 2.1 | -0.6 | 29 | 0 | 14 | 3 | 13.3 | 2.0 |
| FDX | 363 | 0 | 5 | 2.3 | 1.1 | 373 | 0 | 4 | 0 | 10.4 | 1.6 |
| FIN | 315 | 0 | 3 | 2.1 | 0.7 | 316 | 0 | 5 | 1 | 9.0 | 1.2 |
| GAF | 41 | 0 | 0 | 2.3 | -0.4 | 43 | 0 | 2 | 0 | 10.7 | 1.1 |
| HLF | 70 | 0 | 0 | 1.8 | -1.1 | 69 | 0 | 1 | 0 | 9.1 | 0.2 |
| IBE | 794 | 1 | 19 | 2.2 | -0.3 | 793 | 0 | 19 | 0 | 10.6 | 0.8 |
| ICE | 342 | 0 | 1 | 1.9 | 0.1 | 341 | 0 | 3 | 2 | 7.9 | 1.4 |
| KLM | 902 | 0 | 1 | 2.0 | 0.3 | 910 | 0 | 1 | 0 | 9.0 | 1.5 |
| LDA | 208 | 0 | 16 | 2.4 | -1.2 | 210 | 0 | 15 | 0 | 10.3 | 1.4 |
| LDI | 110 | 0 | 3 | 2.1 | -1.4 | 112 | 1 | 4 | 0 | 9.0 | 1.1 |
| LIB | 37 | 0 | 0 | 2.3 | -0.8 | 39 | 0 | 0 | 0 | 8.9 | -1.1 |
| LOT | 147 | 0 | 1 | 1.7 | -0.3 | 149 | 0 | 3 | 0 | 9.4 | 1.4 |
| LTU | 410 | 1 | 7 | 2.3 | 0.5 | 406 | 0 | 6 | 0 | 10.9 | 1.5 |
| MAH | 67 | 1 | 1 | 1.8 | -0.3 | 67 | 0 | 3 | 0 | 9.0 | -1.1 |
| MPH | 231 | 0 | 2 | 1.7 | 0.0 | 231 | 0 | 3 | 0 | 9.2 | 1.4 |
| NWA | 2083 | 0 | 3 | 2.1 | 0.9 | 2101 | 0 | 3 | 1 | 9.7 | 1.6 |
| RAF | 26 | 0 | 0 | 1.7 | -0.1 | 26 | 0 | 0 | 0 | 9.6 | 0.5 |
| RRR | 135 | 3 | 30 | 2.9 | -0.2 | 135 | 0 | 27 | 0 | 9.9 | 2.4 |
| SAS | 1516 | 1 | 1 | 1.8 | -0.1 | 1508 | 0 | 2 | 1 | 8.6 | 1.0 |
| SIA | 70 | 0 | 10 | 1.8 | -0.8 | 69 | 0 | 10 | 0 | 13.5 | 1.5 |
| SPP | 63 | 5 | 11 | 1.7 | -0.6 | 62 | 0 | 8 | 0 | 10.1 | -0.2 |
| SVA | 98 | 1 | 4 | 2.1 | -0.6 | 105 | 0 | 2 | 0 | 10.3 | 1.8 |
| SWR | 42 | 0 | 2 | 1.3 | 0.1 | 42 | 0 | 2 | 0 | 8.2 | 4.2 |
| TAP | 273 | 1 | 2 | 2.0 | -0.8 | 273 | 0 | 2 | 0 | 12.1 | 0.9 |
| TOW | 54 | 0 | 0 | 2.0 | 0.1 | 55 | 0 | 2 | 0 | 12.8 | 1.7 |
| TWA | 597 | 1 | 2 | 2.0 | 0.3 | 586 | 0 | 2 | 0 | 10.5 | 1.1 |
| UAL | 1055 | 1 | 5 | 2.1 | -0.2 | 1072 | 0 | 5 | 4 | 10.2 | 0.5 |
| UKR | 20 | 5 | 35 | 4.7 | 3.2 | 24 | 0 | 25 | 0 | 20.4 | 1.5 |
| ULE | 81 | 0 | 0 | 1.8 | -0.1 | 83 | 0 | 2 | 0 | 10.3 | 1.4 |
| UPS | 294 | 3 | 16 | 2.0 | -0.2 | 298 | 0 | 16 | 0 | 9.6 | 1.8 |
| VIA | 86 | 0 | 14 | 1.4 | 0.2 | 91 | 0 | 14 | 0 | 10.9 | 1.4 |
| WOA | 37 | 0 | 11 | 1.5 | 0.1 | 39 | 0 | 13 | 0 | 8.0 | 2.6 |

| | | TEMPERATURE | | | | | | WIND | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| BA | 4251 | 0 | 6 | 2.0 | 0.7 | 4242 | 1 | 6 | 0 | 12.0 | 1.9 |
| KL | 708 | 6 | 92 | 2.8 | 2.2 | 707 | 2 | 20 | 0 | 14.5 | -0.6 |
| LH | 26 | 0 | 0 | 2.4 | -0.2 | 25 | 0 | 4 | 4 | 10.1 | -0.1 |
| NW | 28 | 0 | 0 | 1.3 | 0.5 | 28 | 0 | 0 | 0 | 6.2 | -1.0 |
| M | 90 | 9 | 100 | 2.7 | 0.1 | 97 | 0 | 5 | 0 | 11.1 | 0.1 |
| N | 120 | 2 | 3 | 2.5 | 0.5 | 135 | 1 | 5 | 0 | 12.7 | 1.0 |

## TABLE 9

### MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:January, 94

**Monitoring procedures:**
**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.

**Area monitored** :0°N - 90°N, 100°W - 40°E

**Standard of comparison** :Background field from Bracknell global model.

**Position** :Average latitude and longitude for period.

**Observation times** :00, 12 UTC.

**Level monitored** :100 hPa.

**Element monitored** :GEOPOTENTIAL HEIGHT in metres

**Parameters monitored** :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

**GROSS ERROR LIMITS** :Defined in Appendix I.1

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | SD | RMS | BIAS |
|---|---|---|---|---|---|---|---|---|
| DBBH | 12 | Z | 100 | 15 | 0 | 20.1 | 35.1 | 28.8 |
| DBLK | 00 | Z | 100 | 1 | 0 | 0.0 | 14.0 | -14.0 |
| FNOR | 00 | Z | 100 | 9 | 0 | 23.7 | 34.4 | 24.9 |
| FNOR | 12 | Z | 100 | 11 | 0 | 20.6 | 20.6 | 1.2 |
| FNOU | 00 | Z | 100 | 7 | 0 | 23.1 | 23.5 | 4.4 |
| FNOU | 12 | Z | 100 | 10 | 0 | 25.9 | 45.5 | 37.5 |
| FNPH | 00 | Z | 100 | 11 | 0 | 21.6 | 21.6 | -0.8 |
| FNPH | 12 | Z | 100 | 13 | 0 | 80.4 | 84.6 | -26.2 |
| FNRS | 00 | Z | 100 | 9 | 0 | 16.6 | 25.4 | 19.2 |
| FNRS | 12 | Z | 100 | 9 | 0 | 17.1 | 18.2 | 6.2 |
| GACA | 00 | Z | 100 | 28 | 0 | 20.4 | 27.6 | 18.6 |
| GACA | 12 | Z | 100 | 28 | 0 | 22.5 | 31.4 | 21.9 |
| JBOA | 00 | Z | 100 | 1 | 0 | 0.0 | 15.0 | -15.0 |
| JCCX | 00 | Z | 100 | 1 | 0 | 0.0 | 4.0 | 4.0 |
| JDWX | 00 | Z | 100 | 1 | 0 | 0.0 | 15.0 | 15.0 |
| LDWR | 00 | Z | 100 | 28 | 0 | 18.3 | 20.9 | 10.0 |
| LDWR | 12 | Z | 100 | 29 | 0 | 21.2 | 21.9 | 5.6 |
| OXYL | 00 | Z | 100 | 3 | 0 | 18.9 | 29.5 | -22.7 |
| OXYL | 12 | Z | 100 | 2 | 0 | 5.0 | 6.4 | 4.0 |
| OZJP | 00 | Z | 100 | 8 | 0 | 20.5 | 21.5 | 6.4 |
| OZJP | 12 | Z | 100 | 7 | 0 | 17.1 | 22.7 | 14.9 |
| P3004 | 00 | Z | 100 | 18 | 0 | 22.4 | 22.4 | 1.4 |
| P3004 | 12 | Z | 100 | 19 | 0 | 17.5 | 23.7 | 15.9 |
| S | 00 | Z | 100 | 1 | 0 | 0.0 | 8.0 | 8.0 |
| SHIP | 00 | Z | 100 | 1 | 0 | 0.0 | 24.0 | 24.0 |
| SHIP | 12 | Z | 100 | 1 | 0 | 0.0 | 86.0 | 86.0 |
| SHIPS | 00 | Z | 100 | 9 | 0 | 31.0 | 42.8 | 29.4 |
| SHIPS | 12 | Z | 100 | 4 | 0 | 30.8 | 49.5 | 38.8 |
| SSHIP | 00 | Z | 100 | 1 | 0 | 0.0 | 8.0 | 8.0 |
| UQYC | 00 | Z | 100 | 1 | 0 | 0.0 | 16.0 | 16.0 |
| VWLV | 00 | Z | 100 | 1 | 0 | 0.0 | 18.0 | 18.0 |
| V2LV | 00 | Z | 100 | 19 | 0 | 34.5 | 37.9 | 15.7 |
| V2LV | 12 | Z | 100 | 26 | 0 | 20.1 | 20.2 | 1.3 |
| V2LX | 00 | Z | 100 | 6 | 0 | 16.4 | 42.5 | 39.2 |
| V2LX | 12 | Z | 100 | 9 | 0 | 9.5 | 45.8 | 44.8 |
| XX36 | 00 | Z | 100 | 1 | 0 | 0.0 | 15.0 | 15.0 |
| ZCAW6 | 00 | Z | 100 | 11 | 0 | 19.1 | 19.1 | -0.1 |
| ZCAW6 | 12 | Z | 100 | 13 | 0 | 18.6 | 18.7 | 1.4 |
| 03953 | 00 | Z | 100 | 25 | 0 | 21.1 | 32.0 | 24.1 |
| 03953 | 12 | Z | 100 | 27 | 0 | 17.1 | 33.9 | 29.2 |
| 04018 | 00 | Z | 100 | 22 | 0 | 20.7 | 22.4 | 8.7 |
| 04018 | 12 | Z | 100 | 28 | 0 | 22.7 | 23.6 | 6.5 |
| 04220 | 00 | Z | 100 | 31 | 0 | 36.6 | 36.8 | 3.7 |
| 04220 | 12 | Z | 100 | 31 | 0 | 29.8 | 32.4 | 12.7 |
| 04270 | 00 | Z | 100 | 27 | 0 | 27.7 | 30.8 | 13.5 |
| 04270 | 12 | Z | 100 | 28 | 0 | 18.7 | 27.5 | 20.2 |
| 04339 | 00 | Z | 100 | 29 | 0 | 26.4 | 30.3 | 14.9 |
| 04339 | 12 | Z | 100 | 31 | 0 | 23.5 | 25.6 | 10.3 |
| 04360 | 00 | Z | 100 | 30 | 0 | 27.5 | 31.0 | 14.3 |
| 04360 | 12 | Z | 100 | 31 | 0 | 25.8 | 28.3 | 11.7 |
| 08001 | 00 | Z | 100 | 24 | 0 | 19.6 | 38.0 | 32.5 |
| 08001 | 12 | Z | 100 | 27 | 0 | 28.6 | 41.4 | 30.0 |
| 08508 | 00 | Z | 100 | 30 | 0 | 26.5 | 29.6 | 13.1 |
| 08508 | 12 | Z | 100 | 31 | 0 | 25.9 | 27.5 | 9.2 |
| 08594 | 00 | Z | 100 | 1 | 0 | 0.0 | 8.0 | -8.0 |
| 08594 | 12 | Z | 100 | 14 | 0 | 16.0 | 16.9 | 5.3 |
| 60020 | 00 | Z | 100 | 28 | 0 | 25.0 | 28.4 | 13.4 |
| 60020 | 12 | Z | 100 | 31 | 0 | 21.3 | 29.0 | 19.7 |
| 71600 | 00 | Z | 100 | 25 | 0 | 18.9 | 19.1 | 2.7 |
| 71600 | 12 | Z | 100 | 25 | 0 | 24.9 | 27.3 | 11.0 |
| 72201 | 00 | Z | 100 | 30 | 0 | 21.0 | 34.6 | 27.5 |
| 72201 | 12 | Z | 100 | 30 | 0 | 22.5 | 29.7 | 19.4 |
| 72304 | 00 | Z | 100 | 26 | 0 | 21.1 | 26.4 | 15.8 |

| WMO<br>IDENT | OBS<br>TIME | ELM | LEV | NUM<br>OBS | NUM<br>GROSS | SD | RMS | BIAS |
|---|---|---|---|---|---|---|---|---|
| 72304 | 12 | Z | 100 | 27 | 1 | 26.3 | 29.7 | 13.8 |
| 72402 | 00 | Z | 100 | 29 | 0 | 18.1 | 31.5 | 25.7 |
| 72402 | 12 | Z | 100 | 30 | 0 | 24.0 | 27.7 | 13.8 |
| 72606 | 00 | Z | 100 | 27 | 0 | 22.7 | 25.8 | -12.3 |
| 72606 | 12 | Z | 100 | 30 | 0 | 24.4 | 26.8 | -11.1 |
| 74494 | 00 | Z | 100 | 25 | 0 | 14.8 | 26.0 | -21.4 |
| 74494 | 12 | Z | 100 | 27 | 0 | 27.7 | 29.0 | -8.8 |
| 78016 | 12 | Z | 100 | 12 | 0 | 31.9 | 34.0 | 11.8 |

## TABLE 10

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH:January, 94

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | :One calendar month. | |
| **Data monitored** | :Reports from each unique identifier for radiosonde TEMPs. | |
| **Area monitored** | :0°N - 90°N, 100°W - 40°E | |
| **Standard of comparison** | :Background field from Bracknell global model. | |
| **Position** | :Average latitude and longitude for period. | |
| **Observation times** | :00, 12 UTC. | |
| **Level monitored** | :500 hPa. | |
| **Element monitored** | :GEOPOTENTIAL HEIGHT in metres | |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :% REJ | :Percentage of observations rejected by quality control at level shown during period. |
| | :SD | :SD of difference of observations from background values at level shown excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values at level shown excluding those with gross errors. |
| **GROSS ERROR LIMITS** | :Defined in Appendix I.1 | |

```
 WMO   OBS                 NUM   NUM
IDENT TIME ELM   LEV       OBS  GROSS      SD     RMS     BIAS

DBBH   12    Z   500       15     0      13.8    13.8     -0.2
DBLK   00    Z   500        1     0       0.0    34.0    -34.0
FNOR   00    Z   500        9     0      12.4    12.7      2.4
FNOR   12    Z   500       12     0      12.7    12.9     -2.2
FNOU   00    Z   500        7     0       6.3    18.7     17.6

FNOU   12    Z   500       10     0      10.9    22.7     19.9
FNPH   00    Z   500       13     0      14.4    14.8     -3.5
FNPH   12    Z   500       13     0      11.2    11.2     -0.2
FNRS   00    Z   500       11     0       6.1    12.4     10.8
FNRS   12    Z   500       10     0       8.9    12.1      8.2

GACA   00    Z   500       28     0      12.2    13.8      6.5
GACA   12    Z   500       29     0      20.8    21.6      5.6
JBOA   00    Z   500        1     0       0.0     5.0     -5.0
JCCX   00    Z   500        1     0       0.0    25.0     25.0
JDWX   00    Z   500        1     0       0.0    12.0     12.0

LDWR   00    Z   500       29     0      12.6    17.9     12.7
LDWR   12    Z   500       29     0      14.9    15.2      2.7
OXYL   00    Z   500        4     0      34.7    41.0    -21.8
OXYL   12    Z   500        3     0       9.3    20.2    -18.0
OZJP   00    Z   500        9     0      11.6    17.1     12.6

OZJP   12    Z   500        8     0      17.1    17.1     -0.6
P3004  00    Z   500       18     0      11.8    11.8     -0.4
P3004  12    Z   500       19     0      10.3    10.8     -3.1
S      00    Z   500        1     0       0.0     1.0      1.0
SHIP   00    Z   500        1     0       0.0    12.0     12.0

SHIP   12    Z   500        2     0      34.5    34.7     -3.5
SHIPS  00    Z   500       12     0      19.1    34.3     28.5
SHIPS  12    Z   500        8     0      10.8    27.9     25.8
SSHIP  00    Z   500        1     0       0.0     1.0      1.0
UQYC   00    Z   500        1     0       0.0     6.0      6.0

VWLV   00    Z   500        1     0       0.0     7.0     -7.0
V2LV   00    Z   500       19     1      10.8    13.1      7.4
V2LV   12    Z   500       27     0      11.5    14.5     -8.9
V2LX   00    Z   500        6     0       9.1    18.3     15.8
V2LX   12    Z   500       10     0      12.9    23.8     20.0

XX36   00    Z   500        1     0       0.0    13.0     13.0
ZCAW6  00    Z   500       10     0      12.9    14.6     -6.8
ZCAW6  12    Z   500       13     0      15.1    19.7    -12.6
03953  00    Z   500       31     0      17.3    21.2     12.3
03953  12    Z   500       31     0      16.3    19.2     10.2

04018  00    Z   500       31     0      11.3    17.1     12.9
04018  12    Z   500       31     0      17.6    18.6      5.9
04220  00    Z   500       31     0      30.9    31.5     -6.4
04220  12    Z   500       31     0      22.2    22.3      1.3
04270  00    Z   500       27     0      22.7    23.4     -5.6

04270  12    Z   500       28     0      21.7    21.8     -1.6
04339  00    Z   500       29     0      25.9    26.3      4.7
04339  12    Z   500       31     0      20.3    21.0      5.4
04360  00    Z   500       30     0      24.7    27.1    -11.2
04360  12    Z   500       31     0      21.7    23.4     -8.7

08001  00    Z   500       26     0      16.6    22.3     14.9
08001  12    Z   500       27     0      23.7    28.5     15.7
08508  00    Z   500       30     0      14.4    20.9     15.2
08508  12    Z   500       31     0      12.5    16.0     10.0
08594  00    Z   500        1     0       0.0    21.0     21.0

08594  12    Z   500       20     0      11.8    13.3      6.1
60020  00    Z   500       29     0      14.9    19.6     12.7
60020  12    Z   500       30     0      18.2    21.7     11.8
71600  00    Z   500       30     0      14.3    14.4     -2.2
71600  12    Z   500       31     0      16.1    17.9     -7.7

72201  00    Z   500       30     0       8.6    11.5      7.6
72201  12    Z   500       31     0       9.8    10.8      4.5
72304  00    Z   500       30     0       7.6     7.6      0.2
```

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| 72304 | 12 | Z | 500 | 31 | 0 | 13.1 | 13.2 | 1.9 |
| 72402 | 00 | Z | 500 | 30 | 0 | 11.7 | 14.0 | 7.7 |
|  |  |  |  |  |  |  |  |  |
| 72402 | 12 | Z | 500 | 31 | 0 | 14.0 | 14.7 | 4.2 |
| 72606 | 00 | Z | 500 | 30 | 0 | 12.2 | 12.5 | -2.9 |
| 72606 | 12 | Z | 500 | 31 | 0 | 16.3 | 17.9 | -7.5 |
| 74494 | 00 | Z | 500 | 29 | 0 | 14.0 | 14.5 | -3.9 |
| 74494 | 12 | Z | 500 | 31 | 0 | 12.5 | 13.6 | -5.3 |
|  |  |  |  |  |  |  |  |  |
| 78016 | 12 | Z | 500 | 26 | 0 | 22.0 | 24.8 | 11.6 |

## TABLE 11

### MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
### MONITORING CENTRE: BRACKNELL
### MONTH:January, 94

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | :One calendar month. | |
| **Data monitored** | :Reports from each unique identifier for radiosonde TEMPs. | |
| **Area monitored** | :0°N - 90°N, 100°W - 40°E | |
| **Standard of comparison** | :Background field from Bracknell global model. | |
| **Position** | :Average latitude and longitude for period. | |
| **Observation times** | :00, 12 UTC. | |
| **Level monitored** | :100 hPa. | |
| **Element monitored** | :VECTOR WIND in m $s^{-1}$ | |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :% REJ | :Percentage of observations rejected by quality control at level shown during period. |
| | :UBIAS, VBIAS | :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |
| **GROSS ERROR LIMITS** | :Defined in Appendix I.2 | |

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| DBBH | 12 | V | 100 | 17 | 0 | 0 | 5.2 | -1.8 | 0.0 |
| DBLK | 00 | V | 100 | 1 | 0 | 0 | 4.7 | -2.4 | -4.1 |
| FNOR | 00 | V | 100 | 9 | 0 | 0 | 4.7 | -0.6 | -0.6 |
| FNOR | 12 | V | 100 | 11 | 0 | 0 | 5.0 | -0.6 | -0.7 |
| FNOU | 00 | V | 100 | 7 | 0 | 0 | 7.7 | 3.2 | 1.0 |
| FNOU | 12 | V | 100 | 10 | 0 | 0 | 7.7 | 0.5 | -1.4 |
| FNPH | 00 | V | 100 | 10 | 0 | 0 | 3.2 | 0.5 | 1.0 |
| FNPH | 12 | V | 100 | 10 | 0 | 0 | 4.3 | 0.7 | -0.7 |
| FNRS | 00 | V | 100 | 9 | 0 | 0 | 5.3 | 1.2 | 1.3 |
| FNRS | 12 | V | 100 | 8 | 0 | 0 | 5.3 | -1.4 | 1.4 |
| GACA | 00 | V | 100 | 26 | 0 | 0 | 5.3 | -1.7 | 0.7 |
| GACA | 12 | V | 100 | 28 | 0 | 0 | 5.1 | -2.1 | -0.9 |
| JBOA | 00 | V | 100 | 1 | 0 | 0 | 3.8 | 0.2 | 1.7 |
| JCCX | 00 | V | 100 | 1 | 0 | 0 | 3.8 | -1.9 | -4.5 |
| JDWX | 00 | V | 100 | 1 | 0 | 0 | 3.8 | 3.9 | 3.5 |
| LDWR | 00 | V | 100 | 28 | 0 | 0 | 3.8 | 0.9 | -0.9 |
| LDWR | 12 | V | 100 | 29 | 0 | 0 | 3.5 | -0.1 | -1.5 |
| OXYL | 00 | V | 100 | 3 | 0 | 0 | 2.9 | -1.3 | 1.0 |
| OXYL | 12 | V | 100 | 2 | 0 | 0 | 2.9 | -2.0 | 2.0 |
| OZJP | 00 | V | 100 | 8 | 0 | 0 | 2.9 | -0.7 | -0.9 |
| OZJP | 12 | V | 100 | 7 | 0 | 0 | 2.9 | -0.7 | -1.9 |
| P3004 | 00 | V | 100 | 18 | 0 | 0 | 2.9 | -1.0 | -0.6 |
| P3004 | 12 | V | 100 | 19 | 0 | 0 | 3.5 | -2.1 | 0.0 |
| S | 00 | V | 100 | 1 | 0 | 0 | 4.0 | 4.0 | 1.0 |
| SHIP | 00 | V | 100 | 1 | 0 | 0 | 4.0 | 6.0 | -0.1 |
| SHIP | 12 | V | 100 | 1 | 0 | 0 | 4.0 | -0.5 | -2.0 |
| SHIPS | 00 | V | 100 | 9 | 0 | 0 | 4.0 | 2.9 | -0.1 |
| SHIPS | 12 | V | 100 | 4 | 0 | 0 | 4.0 | 0.3 | 2.3 |
| SSHIP | 00 | V | 100 | 1 | 0 | 0 | 4.0 | 4.0 | 1.0 |
| UQYC | 00 | V | 100 | 1 | 0 | 0 | 4.0 | 0.8 | 0.6 |
| VWLV | 00 | V | 100 | 1 | 0 | 0 | 1.6 | 14.8 | 9.3 |
| V2LV | 00 | V | 100 | 19 | 0 | 0 | 1.6 | -0.7 | -2.6 |
| V2LV | 12 | V | 100 | 26 | 0 | 0 | 5.0 | -2.6 | -1.7 |
| V2LX | 00 | V | 100 | 6 | 0 | 0 | 4.6 | -0.3 | -2.9 |
| V2LX | 12 | V | 100 | 9 | 0 | 0 | 4.6 | -0.3 | -3.5 |
| XX36 | 00 | V | 100 | 1 | 0 | 0 | 4.6 | 3.4 | 4.9 |
| ZCAW6 | 00 | V | 100 | 11 | 0 | 0 | 4.6 | 0.2 | 1.6 |
| ZCAW6 | 12 | V | 100 | 13 | 0 | 0 | 3.7 | -0.4 | 1.3 |
| 03953 | 00 | V | 100 | 22 | 0 | 0 | 6.8 | 0.4 | 0.9 |
| 03953 | 12 | V | 100 | 27 | 0 | 0 | 2.4 | -2.1 | -1.1 |
| 04018 | 00 | V | 100 | 18 | 0 | 0 | 4.5 | -0.2 | -0.3 |
| 04018 | 12 | V | 100 | 28 | 0 | 0 | 3.7 | -1.4 | -0.9 |
| 04220 | 00 | V | 100 | 31 | 0 | 0 | 2.8 | -0.1 | 1.7 |
| 04220 | 12 | V | 100 | 31 | 0 | 0 | 2.1 | 0.4 | 0.1 |
| 04270 | 00 | V | 100 | 27 | 0 | 0 | 2.3 | 1.4 | 1.9 |
| 04270 | 12 | V | 100 | 28 | 0 | 0 | 5.5 | -0.5 | 0.9 |
| 04339 | 00 | V | 100 | 28 | 0 | 0 | 2.9 | 1.2 | -0.3 |
| 04339 | 12 | V | 100 | 31 | 0 | 0 | 3.2 | 0.0 | -0.9 |
| 04360 | 00 | V | 100 | 30 | 0 | 0 | 3.1 | -0.8 | 1.5 |
| 04360 | 12 | V | 100 | 31 | 0 | 0 | 2.5 | -0.2 | 0.1 |
| 08001 | 00 | V | 100 | 23 | 0 | 0 | 4.8 | 0.6 | 1.7 |
| 08001 | 12 | V | 100 | 26 | 0 | 0 | 5.5 | 0.4 | 1.6 |
| 08508 | 00 | V | 100 | 30 | 0 | 0 | 5.2 | 0.1 | -0.4 |
| 08508 | 12 | V | 100 | 31 | 0 | 0 | 5.1 | -1.9 | 0.5 |
| 08594 | 00 | V | 100 | 1 | 0 | 0 | 4.9 | -4.1 | 0.8 |
| 08594 | 12 | V | 100 | 14 | 0 | 0 | 4.9 | -3.4 | 2.9 |
| 60020 | 00 | V | 100 | 27 | 0 | 0 | 3.8 | 1.8 | 0.0 |
| 60020 | 12 | V | 100 | 31 | 0 | 0 | 4.4 | -3.1 | 2.0 |
| 71600 | 00 | V | 100 | 22 | 1 | 13 | 4.1 | -6.1 | -4.0 |
| 71600 | 12 | V | 100 | 23 | 0 | 8 | 12.5 | -2.7 | -0.2 |
| 72201 | 00 | V | 100 | 29 | 0 | 0 | 3.1 | 1.4 | 0.2 |
| 72201 | 12 | V | 100 | 29 | 0 | 0 | 3.7 | 0.2 | 0.9 |
| 72304 | 00 | V | 100 | 21 | 0 | 4 | 4.7 | 1.1 | 2.5 |

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| 72304 | 12 | V | 100 | 20 | 0 | 10 | 7.6 | 1.1 | 1.9 |
| 72402 | 00 | V | 100 | 26 | 0 | 0 | 3.9 | 0.8 | 0.1 |
| 72402 | 12 | V | 100 | 27 | 0 | 0 | 3.9 | 1.5 | 0.3 |
| 72606 | 00 | V | 100 | 14 | 0 | 0 | 4.6 | -1.7 | 1.1 |
| 72606 | 12 | V | 100 | 15 | 0 | 0 | 4.4 | -1.0 | 1.0 |
| 74494 | 00 | V | 100 | 20 | 0 | 0 | 3.6 | -1.6 | 2.5 |
| 74494 | 12 | V | 100 | 25 | 0 | 0 | 4.8 | -1.6 | 0.1 |
| 78016 | 12 | V | 100 | 12 | 0 | 0 | 2.7 | -0.7 | -1.4 |

## TABLE 12

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH:January, 94

Monitoring procedures:

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.

**Area monitored** :0°N - 90°N, 100°W - 40°E

**Standard of comparison** :Background field from Bracknell global model.

**Position** :Average latitude and longitude for period.

**Observation times** :00, 12 UTC.

**Level monitored** :500 hPa.

**Element monitored** :VECTOR WIND in m s$^{-1}$

**Parameters monitored**

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS, VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

**GROSS ERROR LIMITS** :Defined in Appendix I.2

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| DBBH | 12 | V | 500 | 14 | 0 | 0 | 4.6 | -1.8 | 1.9 |
| DBLK | 00 | V | 500 | 1 | 0 | 0 | 4.4 | 0.9 | 4.3 |
| FNOR | 00 | V | 500 | 9 | 0 | 0 | 4.4 | 0.5 | -0.3 |
| FNOR | 12 | V | 500 | 12 | 0 | 0 | 1.7 | -0.8 | -0.9 |
| FNOU | 00 | V | 500 | 7 | 0 | 0 | 4.5 | 1.5 | -1.3 |
| FNOU | 12 | V | 500 | 10 | 0 | 0 | 4.5 | -1.9 | 2.6 |
| FNPH | 00 | V | 500 | 12 | 0 | 0 | 3.9 | -0.8 | -1.5 |
| FNPH | 12 | V | 500 | 13 | 0 | 7 | 2.6 | -3.3 | 1.0 |
| FNRS | 00 | V | 500 | 11 | 0 | 0 | 4.5 | 1.4 | -0.1 |
| FNRS | 12 | V | 500 | 9 | 0 | 0 | 3.4 | -1.6 | 0.5 |
| GACA | 00 | V | 500 | 28 | 0 | 0 | 3.4 | -0.7 | 1.1 |
| GACA | 12 | V | 500 | 29 | 0 | 0 | 5.4 | -0.6 | -0.6 |
| JBOA | 00 | V | 500 | 1 | 0 | 0 | 3.8 | 3.3 | 1.4 |
| JCCX | 00 | V | 500 | 1 | 0 | 0 | 3.8 | -0.3 | 4.7 |
| JDWX | 00 | V | 500 | 1 | 0 | 0 | 3.8 | -2.2 | 0.0 |
| LDWR | 00 | V | 500 | 29 | 0 | 0 | 3.8 | 0.1 | 1.1 |
| LDWR | 12 | V | 500 | 29 | 0 | 3 | 4.6 | 2.3 | 1.0 |
| OXYL | 00 | V | 500 | 4 | 0 | 0 | 4.8 | 0.3 | 1.4 |
| OXYL | 12 | V | 500 | 2 | 0 | 0 | 4.8 | -2.2 | -3.8 |
| OZJP | 00 | V | 500 | 9 | 0 | 0 | 4.8 | -0.4 | -1.1 |
| OZJP | 12 | V | 500 | 8 | 0 | 0 | 3.8 | -1.8 | -1.0 |
| P3004 | 00 | V | 500 | 17 | 0 | 0 | 3.8 | -0.5 | 1.8 |
| P3004 | 12 | V | 500 | 19 | 0 | 0 | 2.8 | -0.3 | 0.7 |
| S | 00 | V | 500 | 1 | 0 | 0 | 3.4 | 2.5 | -0.6 |
| SHIP | 00 | V | 500 | 1 | 0 | 0 | 3.4 | -2.8 | 4.3 |
| SHIP | 12 | V | 500 | 2 | 0 | 0 | 3.4 | -4.7 | -2.8 |
| SHIPS | 00 | V | 500 | 12 | 0 | 8 | 3.4 | -1.9 | -0.9 |
| SHIPS | 12 | V | 500 | 7 | 0 | 0 | 6.7 | -0.4 | -0.1 |
| SSHIP | 00 | V | 500 | 1 | 0 | 0 | 6.7 | 2.5 | -0.6 |
| UQYC | 00 | V | 500 | 1 | 0 | 0 | 6.7 | -0.6 | 0.2 |
| VWLV | 00 | V | 500 | 1 | 0 | 0 | 4.3 | 2.7 | -3.0 |
| V2LV | 00 | V | 500 | 20 | 0 | 0 | 4.3 | 0.0 | 0.5 |
| V2LV | 12 | V | 500 | 27 | 0 | 0 | 3.3 | -1.2 | 0.1 |
| V2LX | 00 | V | 500 | 6 | 0 | 0 | 4.1 | 1.8 | -1.1 |
| V2LX | 12 | V | 500 | 10 | 0 | 0 | 4.1 | 0.5 | 1.3 |
| XX36 | 00 | V | 500 | 1 | 0 | 0 | 3.8 | -2.6 | 0.8 |
| ZCAW6 | 00 | V | 500 | 10 | 0 | 0 | 3.8 | 1.6 | 2.5 |
| ZCAW6 | 12 | V | 500 | 13 | 0 | 0 | 4.6 | 1.9 | -0.3 |
| 03953 | 00 | V | 500 | 31 | 0 | 0 | 4.9 | 0.1 | 0.7 |
| 03953 | 12 | V | 500 | 31 | 0 | 0 | 3.7 | -1.6 | 0.3 |
| 04018 | 00 | V | 500 | 30 | 0 | 0 | 4.5 | -0.6 | 1.9 |
| 04018 | 12 | V | 500 | 31 | 0 | 0 | 4.3 | 0.1 | 0.7 |
| 04220 | 00 | V | 500 | 31 | 0 | 3 | 3.8 | -1.1 | 2.6 |
| 04220 | 12 | V | 500 | 30 | 0 | 0 | 4.9 | -1.7 | 1.1 |
| 04270 | 00 | V | 500 | 27 | 0 | 0 | 5.0 | 0.9 | 0.1 |
| 04270 | 12 | V | 500 | 28 | 0 | 0 | 4.2 | 0.7 | 0.8 |
| 04339 | 00 | V | 500 | 29 | 0 | 0 | 5.5 | 0.9 | -0.7 |
| 04339 | 12 | V | 500 | 31 | 0 | 0 | 4.7 | -1.1 | -1.2 |
| 04360 | 00 | V | 500 | 30 | 0 | 0 | 5.3 | -0.4 | -0.6 |
| 04360 | 12 | V | 500 | 31 | 0 | 0 | 3.9 | 0.2 | 0.3 |
| 08001 | 00 | V | 500 | 24 | 0 | 0 | 3.7 | 0.4 | -0.2 |
| 08001 | 12 | V | 500 | 26 | 0 | 0 | 3.9 | 0.2 | -0.9 |
| 08508 | 00 | V | 500 | 30 | 0 | 0 | 4.9 | 1.2 | -0.6 |
| 08508 | 12 | V | 500 | 31 | 0 | 0 | 3.6 | -0.4 | 0.3 |
| 08594 | 00 | V | 500 | 1 | 0 | 0 | 4.6 | -2.9 | -7.6 |
| 08594 | 12 | V | 500 | 20 | 0 | 0 | 4.6 | -3.1 | 0.3 |
| 60020 | 00 | V | 500 | 29 | 0 | 0 | 2.6 | -1.2 | -1.3 |
| 60020 | 12 | V | 500 | 30 | 0 | 3 | 5.4 | -3.0 | -0.8 |
| 71600 | 00 | V | 500 | 29 | 0 | 0 | 3.0 | -0.5 | 2.0 |
| 71600 | 12 | V | 500 | 30 | 0 | 0 | 5.2 | 1.0 | 0.3 |
| 72201 | 00 | V | 500 | 30 | 0 | 0 | 3.7 | 0.3 | 0.4 |
| 72201 | 12 | V | 500 | 29 | 0 | 0 | 2.5 | 0.5 | 1.0 |
| 72304 | 00 | V | 500 | 30 | 0 | 0 | 3.3 | -2.1 | 1.0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 72304 | 12 | V | 500 | 29 | 0 | 0 | 3.2 | 0.1 | 1.7 |
| 72402 | 00 | V | 500 | 30 | 0 | 0 | 4.5 | 0.9 | 0.1 |
| 72402 | 12 | V | 500 | 31 | 0 | 0 | 3.3 | 1.2 | 0.6 |
| 72606 | 00 | V | 500 | 30 | 0 | 0 | 4.9 | -1.8 | 0.1 |
| 72606 | 12 | V | 500 | 31 | 0 | 0 | 4.0 | -0.8 | 0.1 |
| 74494 | 00 | V | 500 | 29 | 0 | 0 | 3.9 | -2.3 | 0.8 |
| 74494 | 12 | V | 500 | 31 | 0 | 0 | 4.4 | -1.5 | 2.4 |
| 78016 | 12 | V | 500 | 25 | 0 | 0 | 3.6 | 3.4 | 0.0 |

## APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Table 4 are:-

| Level (hPa) | Geopotential height (metres) |
|---|---|
| 1000 | 100 |
| 850 | 100 |
| 700 | 100 |
| 500 | 150 |
| 400 | 175 |
| 300 | 200 |
| 250 | 225 |
| 200 | 250 |
| 150 | 275 |
| 100 | 300 |
| 70 | 375 |
| 50 | 400 |
| 30 | 450 |

The weighted RMS values used in Table 4 are calculated using the following weights:-

| Level (hPa) | Weight |
|---|---|
| 1000 | 3.70 |
| 850 | 3.40 |
| 700 | 2.90 |
| 500 | 2.20 |
| 400 | 1.90 |
| 300 | 1.60 |
| 250 | 1.50 |
| 200 | 1.37 |
| 150 | 1.19 |
| 100 | 1.00 |
| 70 | 0.87 |
| 50 | 0.80 |
| 30 | 0.64 |

2. The gross error limits for observation minus background differences of windspeed in Table 5 are:-

| Level (hPa) | Windspeed m $s^{-1}$ |
|---|---|
| 1000 | 35 |
| 850 | 35 |
| 700 | 40 |
| 500 | 45 |
| 400 | 50 |
| 300 | 60 |
| 250 | 60 |
| 200 | 50 |
| 150 | 50 |
| 100 | 45 |